

radio amateur

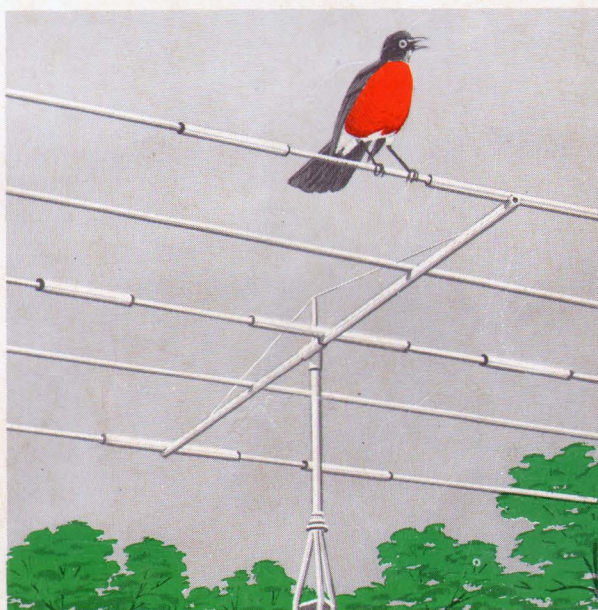
# callbook

magazine



## SPRING

*O March that blusters  
and March that blows,  
What color under your  
footsteps glows!  
Beauty you summon from  
winter snows,  
And you are the pathway  
that leads to the rose.*



## spring 1966

### in this issue

- 3,574 new licenses issued by FCC since the Winter 1965-66 edition.
- Over 36,000 changes in listings.
- 270,567 licensed radio amateurs in the U.S.A.
- Radio Amateur prefixes of the world, with map.
- Great circle bearings; "Q" and "Z" signals; postal information.
- A.R.R.L. countries list, phonetic alphabet, DX operating code.
- Time conversion chart, telegraphers' abbreviations . . . and other features.

personal copy of:

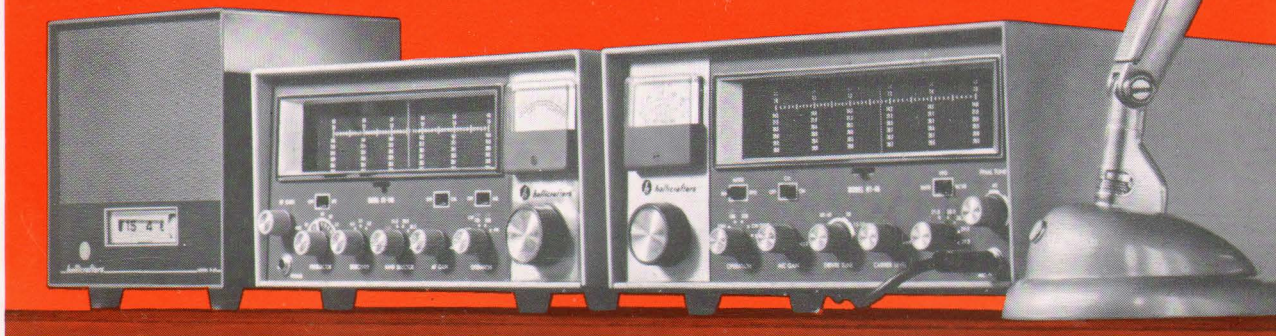
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## Hallicrafters advanced technology brings you a new breed of amateur equipment



### SX-146 Receiver

This is an amateur band receiver of advanced design employing a single conversion signal path and pre-mixed oscillator chain to assure high order frequency stability and freedom from adjacent channel cross-modulation products. The SX-146 employs a high frequency quartz crystal filter and has provision for installation of two more crystal filters. The receiver may also be used from 2 to 30 mc, with the exception of a narrow gap at 9.0 mc, with the connection of auxiliary oscillators. The highly stable conversion oscillator chain may be used for transceiver operation of the matching HT-46 transmitter.

**FREQUENCY BANDS:** 3.5-4.0; 7.0-7.5; 14.0-14.5; 21.0-21.5; 28.0-28.5; 28.5-29.0; 29.0-29.5; 29.5-30.0 mc (28.0 to 28.5, 29.0 to 30.0 requires extra crystals at users option).

**SENSITIVITY:** Better than 1  $\mu$ v for 20 db S/N.

**TUBES AND FUNCTIONS:** 6JD6 RF amplifier; 12AT7 Signal mixer and cathode follower; (2) 6AU6A 9 mc IF amplifier; 12AT7 AM detector—AVC rectifier—product detector; 12AT7 USB—LSB crystal oscillators; 6GW8 Audio amplifier and audio output; 6BA6 Variable frequency oscillator; 6EA8 Crystal heterodyne oscillator and pre-mixer; Plus diode power supply rectifier, ANL diode and AVC gates diode; \*6AU6A—100 kc crystal calibrator oscillator; \*Harmonic generator diode.

**PHYSICAL DATA:** Size: 5 $\frac{7}{8}$ " x 13 $\frac{1}{8}$ " x 11". Shipping wt., 20 lbs.

**FRONT PANEL CONTROLS:** Frequency: Power off CW-upper-lower and AM; Audio gain; Band selector—3.5, 7.0, 14, 21.0, 28.0, 28.5, 29.0, 29.5; Selectivity—0.5, 2.1, 5.0 kc (0.5 and 5.0 kc filters optional extra); Pre-selector; RF gain; AVC on-off; Cal. on-off; ANL on-off; Phone set jack; Smeter.

**REAR CHASSIS:** S-meter zero adjust; Internal-External oscillator switch; Slave oscillator output; External oscillator input; Antenna socket; Speaker, ground and mute terminals; Grounding stud; AC power cord.

**POWER REQ.:** 105/125 volt—50/60 cycle AC—55 watts.

**I-F SELECTIVITY:** Uses a 6-pole crystal filter to obtain a nose-to-skirt ratio better than 1 to 1.8.

Amateur net, \$269.95

Model HA-19 plug-in, 100-kc quartz calibrator available as accessory. Amateur net, \$19.95

\*Part of HA-19 calibrator.

Available in Canada from Gould Sales Co.

### HT-46 5-band transmitter

All new from the ground up! Here's the "new breed" transmitter that matches your SX-146 . . . works independently or may be interconnected for transceiver operation.

**FEATURES:** 180 watts PEP input on SSB; 140 watts on CW; Frequency control independent or slaved to SX-146 receiver; Upper or lower sideband via 9 mc quartz filter; Built-in power supply; Press-to-talk or optional plug-in VOX; grid block for keying for CW.

**FREQUENCY COVERAGE:** 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5 mc and 28-30 mc in four 500-kc steps. Crystal supplied for 28.5-29.0 mc coverage. Other plug-in crystals at user's option.

**TUBES:** 6BA6 VFO; 6EA8 Heterodyne crystal oscillator and mixer; 12AT7 Carrier oscillator-third audio; 12AT7 Mic amplifier; 6EA8 9 mc I-F amplifier and AALC; 6AH6 Mixer; 12BY7 Driver; 6HF5 Power amplifier; 0A2 Reg.

**FRONT PANEL CONTROLS:** Frequency Tuning; Operation-Off, Standby, USB, LSB, CW-Tune, Standby LSB USB; Microphone gain; Driver tune; Carrier level; Band selector; Final tune; VFO selector—Transmitter-Receiver; Dial cal.; Calibrate Off-On; Meter MA-RFO.

**REAR APRON FUNCTIONS:** AC Cord; Ground lug; Fuse; Key jack; VOX accessory socket; Antenna jack; Receiver input (for transceiver); 11 pin control socket; bias adjust.

**PHYSICAL DATA:** Size: 5 $\frac{7}{8}$ " x 13 $\frac{1}{8}$ " x 11". Shipping wt., 26 $\frac{1}{2}$  lbs.

HA-16 Vox Adapter, \$37.95

Amateur net, \$349.95

R-51 Speaker.

4 x 6 inch oval speaker and attractive 24 hour clock.  
amateur net \$34.95

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# radio amateur **callbook** magazine

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## RADIO AMATEURS OF THE U.S.A.

VOLUME 44  
NUMBER 1

ALL K AND W CALLS

SPRING 1966

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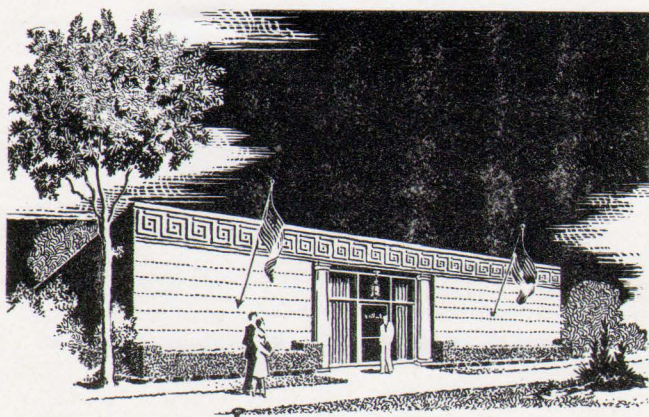
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The Home of RADIO AMATEUR CALLBOOK . . . . a modern air-conditioned building planned for maximum efficiency in the production of Callbooks and Callbook products.

A year around staff, through the use of electronic data processing equipment, evaluates and compiles the directory information received daily from all over the world. Extensive library and historical records are maintained to provide the most complete and accurate Callbook possible to produce.

The Callbook had its beginning back in 1920 when there were just a few radio amateurs. Today, Callbooks and Callbook products are in use in every country of the world.



RV-4

TA-3640

Above is the Mosley TA-36 with the New Mosley TA-40 K to the radiating element for outstanding performance on four bands, 10, 15, 20 and 40 meters. Operation of the Mosley TA-3640 include four working elements on 10, three working elements on 15, three working elements on 20 and a single radiating element on 40 meters. Performance of the TA-3640 features Forward Gain of 9 db. on 10 meters, 8.5 db. on 15 meters and 8 db. on 20 meters. Front-To-Back is 20 db. or better on 10, 15 and 20 meters. SWR on each of the four bands is 1.5/1 or better on all frequencies.

Antenna is fed with a single 52 ohm coax and weighs just 15 lbs. Mosley TA-3640 has a turning radius of 19' 6" and is constructed of heavy-wall aluminum tubing for maximum strength. Boom is 2" OD X 24". Elements are of 1-1/8" to 5/8" aluminum tubing with a maximum length of 38' 7". Center element sections feature thick tubing to reduce sag.

Setting the pace in verticals is this ALL NEW MOSLEY RV-4RK, roof mounting kit. Here is a quarter wave, self-supporting, vertical designed for optimum performance from either ground or roof-top installation. Rated to 700 watts, AM, 1000 watts, CW and 2000 watts P.E.P., SSB, input to the final amplifier. The RV-4 is factory pre-tuned to maintain a low SWR over full frequency range. When installed at ground level, no radials are required.

Antenna is fed with a single 52 ohm coax and weighs just 79 lbs. Mosley TA-3640 has a turning radius of 19' 6" and is constructed of heavy-wall aluminum tubing for maximum strength. Boom is of 2" OD X 24'. Elements are of 1-1/8" to 5/8" aluminum with a maximum length of 38' 7". Center element sections feature double thick tubing to reduce sag.

**MOSLEY ELECTRONICS INCORPORATED**  
4610 N. Lindbergh Blvd. Bridgeton, Mo., 63042



# PREFIXES—BY COUNTRIES

The following countries listed in alphabetical order by country show international radio amateur prefixes. Characters in ( ) designate the continent and zone in which the country is located. Abbreviations are as follows: A—Asia, AF—Africa, E—Europe, NA—North America, O—Oceania, SA—South America.

Aden (South Arabia).....(A-21).....VS9  
Afghanistan.....(A-21).....YA  
Åland Is.....(E-14).....OH0  
Alaska.....(NA-1).....KL7  
Albania.....(E-15).....ZA  
Algeria.....(AF-33).....7X  
Amsterdam & St. Paul Is.....(AF-39).....FB8  
Andaman & Nicobar Is.....(A-26).....VU5  
Andorra.....(E-14).....PX1  
Angola.....(AF-36).....CR6  
Antarctica.....CE9, KC4AA, KC4US, LA-/G  
LU-/Z, OR4, UA1, VK0, VP8, ZL5, 8J1  
Argentina.....(SA-13).....LU  
Ascension Is.....(AF-36).....ZD8  
Austral & French Antarctic (A-39).....FB8  
Australia.....(O-29 & 30).....VK  
Austria.....(E-15).....OE  
Azores Is.....(E-14).....CT2

Bahama Is.....(NA-8).....VP7  
Bahrain Is.....(A-21).....MP4B  
Baker Is.....(O-31).....KB6  
Balearic Is.....(E-14).....EA6  
Barbados Is.....(NA-8).....VP6  
Basutoland.....(AF-38).....ZS8  
Bechuanaland.....(AF-38).....ZS9  
Belgium.....(E-14).....ON  
Bermuda Is.....(NA-5).....VP9  
Bhutan.....(A-22).....AC5  
Bolivia.....(SA-10).....CP  
Borneo.....(O-28).....8F5  
Brazil.....(SA-11).....PY  
British Honduras.....(NA-7).....VP1  
British Phoenix Is.....(O-31).....VR1  
Brunei.....(O-28).....VS5  
Bulgaria.....(E-20).....LZ  
Burma.....(A-26).....XZ  
Burundi.....(AF-36).....9U5

Cambodia.....(A-26).....XU  
Cameroun.....(AF-36).....TJ  
Canada.....(NA-1 to 5).....VE, V0  
Canal Zone.....(NA-7).....KZ5  
Canary Is.....(AF-33).....EA8  
Canton Is.....(O-31).....KB6  
Cape Verde Is.....(AF-35).....CR4  
Caroline Is.....(O-27).....KC6  
Cayman Is.....(NA-8).....ZF1  
Celebes & Molucca Is.....(O-28).....8F6  
Central African Republic.....(AF-36).....TL8  
Ceuta y Melilla, Spanish.....(A-33).....EA9  
Ceylon.....(A-22).....4S7  
Chad.....(AF-36).....TT8  
Chagos Is.....(AF-39).....VQ8  
Channel Is.....(E-14).....GC  
Chatham Is.....(O-32).....ZL  
Chile.....(SA-12).....CE  
China.....(A-23 & 24).....BY  
Christmas Is.....(O-29).....VK9  
Clipperton Is.....(NA-7).....F08  
Cocos Is.....(NA-7).....TI9  
Cocos-Keeling Is.....(O-29).....VK9  
Colombia.....(SA-9).....HK  
Comoro Is.....(AF-39).....FH8  
Congo, Republic of.....(AF-36).....TN8  
Congo, Republic of the.....(AF-36).....9Q5  
Cook Is.....(O-32).....ZK1  
Corsica.....(E-15).....FC  
Costa Rica.....(NA-7).....TI  
Crete.....(E-20).....SV  
Crozet Is.....(AF-39).....FB8  
Cuba.....(NA-8).....CM, C0  
Cyprus.....(A-20).....5B4, ZC4  
Czechoslovakia.....(E-15).....OK

Dahomey.....(AF-35).....TY  
Das Is.....(A-21).....MP4D  
Denmark.....(E-14).....OZ  
Dodecanese Is.....(E-20).....SV5  
Dominican Republic.....(NA-8).....HI

Easter Is.....(SA-12).....CE0A  
Ecuador.....(SA-10).....VP8  
Egypt.....(AF-34).....SU  
El Salvador.....(NA-7).....YS  
Enderbury Is.....(O-31).....KB6  
England.....(E-14).....G  
Ethiopia.....(AF-37).....ET3

Faeroe Is.....(E-14).....OY  
Falkland Is.....(SA-13).....VP8  
Fanning Is.....(O-31).....VR3  
Fernando de Noronha.....(SA-11).....PY7  
Fiji Is.....(O-32).....VR2  
Finland.....(E-15).....OH  
France.....(E-14).....F  
French Polynesia.....(O-32).....F08

Gabon.....(AF-36).....TR8  
Galapagos Is.....(SA-10).....HC8  
Gambia.....(AF-35).....ZD3  
German Federal Rep, West (E-14).....DJ, DL  
German Dem. Rep, East (E-14).....DM  
Ghana.....(AF-35).....9G1  
Gibraltar.....(E-14).....ZB2  
Gilbert Is.....(O-31).....VR1  
Goa.....(A-22).....CR8  
Graham Land.....(SA-13).....VP8  
Greece.....(E-20).....SV  
Greenland.....(NA-40).....OX  
Guadeloupe Is.....(NA-8).....FG7  
Guantanamo Bay.....(NA-8).....KG4  
Guatemala.....(NA-7).....TG

Guiana, British.....(SA-9).....VP3  
Guiana, French.....(SA-9).....FY7  
Guinea, Portuguese.....(AF-35).....CR3  
Guinea, Republic of.....(AF-35).....7G1

Haiti.....(NA-8).....HH  
Hawaii.....(O-31).....KH6  
Heard Is.....(O-39).....VK0  
Honduras.....(NA-7).....HR  
Hong Kong.....(A-24).....VS6  
Howland Is.....(O-31).....KB6  
Hungary.....(E-15).....HA, HG

Iceland.....(E-40).....TF  
Icni.....(AF-33).....EA9  
India.....(A-22).....VU  
Indonesia.....(O-28).....8F  
Iran.....(A-21).....EP, EQ  
Iraq.....(A-21).....YI  
Ireland.....(E-14).....EI  
Isle of Man.....(E-14).....GD  
Israel.....(A-20).....4X4  
Italy.....(E-15).....I  
Ivory Coast.....(AF-35).....TU2

Jamaica.....(NA-8).....6Y5  
Jan Mayen Is.....(E-40).....LA  
Japan.....(A-25).....JA  
Jarvis Is.....(O-31).....KP6  
Java.....(O-28).....8F1, 2, 3  
Johnston Is.....(O-31).....KJ6  
Jordan.....(A-20).....JY  
Juan Fernandez Is.....(SA-12).....CE0Z

Kamran Is.....(A-21).....VS9K  
Kenya.....(AF-37).....Z4  
Kerguelen Is.....(AF-39).....FB8  
Kermadec Is.....(O-32).....ZL1  
Korea.....(A-25).....HM, HL9  
Kuwait.....(A-21).....9K2

Labrador.....(NA-2).....V02  
Laccadive Is.....(A-22).....VU4  
Laos.....(A-26).....XW8  
Lebanon.....(A-20).....OD5  
Leeward Is. (Br. W. Indies).....(NA-8).....VP2  
Liberia.....(AF-35).....EL  
Libya.....(AF-34).....5A  
Liechtenstein.....(E-14).....HB0  
Line Is.....(O-31).....VR3  
Little America.....(SA-13).....KC4  
Lord Howe Is.....(O-30).....VK2  
Luxembourg.....(E-14).....LX

Macao.....(A-24).....CR9  
Macquarie Is.....(O-30).....VK0  
Madeira Is.....(AF-33).....CT3  
Malagasy (Madagascar).....(AF-39).....5R8  
Malawi (Nyasaland).....(AF-37).....7Q7  
Malaysia, Federation of.....(A-28).....9M2  
Maldives Is.....(A-22).....VS9M  
Mali Republic.....(AF-35).....TZ  
Malta.....(E-15).....9H1  
Manchuria.....(A-24).....BY9  
Manihiki Is.....(O-32).....HD1  
Mariana Is.....(O-27).....KG6  
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Mauritania.....(AF-35).....5T5  
Mauritius Is.....(AF-39).....VQ8  
Mexico.....(NA-6).....XE  
Midway Is.....(O-31).....KM6  
Monaco.....(E-14).....3A2  
Mongolia.....(A-23).....JT1  
Morocco.....(AF-33).....CN  
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Nauru Is.....(O-31).....VK9  
Navassa Is.....(NA-8).....KC4  
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New Guinea, N.E.....(O-28).....VK9  
New Hebrides.....(O-32).....FU8, YJ  
New Zealand.....(O-32).....ZL  
Nicaragua.....(NA-7).....YN  
Niger.....(AF-35).....5U7  
Nigeria.....(AF-35).....5N2  
Niue Is.....(O-32).....ZK2  
Norfolk Is.....(O-32).....VK9  
Northern Ireland.....(E-14).....GI  
Norway.....(E-14).....LA

Pakistan.....(A-21, 22).....AP  
Palmyra Is.....(O-31).....KP6  
Panama.....(NA-7).....HP  
Papua Territory.....(O-28).....VK9  
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Peru.....(SA-10).....OA  
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Saba Is.....(NA-8).....PJ(S)  
Sabah (North Borneo).....(O-28).....9M6  
Saint Helena Is.....(AF-36).....ZD7  
Saint Maarten Is.....(NA-8).....PJ2M  
Saint Martin Is.....(NA-8).....FS7  
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Uzbek S.S.R.....(A-17).....UI8  
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Kazakh S.S.R.....(A-17).....UL7  
Kirghiz S.S.R.....(A-17).....UM8  
Karelo-Finnish S.S.R.....(E-16).....UN1  
Moldavian S.S.R.....(E-16).....U05  
Lithuanian S.S.R.....(E-15).....UP5  
Latvian S.S.R.....(E-15).....UQ  
Estonian S.S.R.....(E-15).....UR

Spain.....(E-14).....EA  
Spanish Sahara (Rio de Oro) (A-33).....EA9  
Sudan.....(AF-34).....ST  
Sumatra.....(O-28).....8F4  
Surinam (Neth. Guiana).....(SA-9).....PZ  
Svalbard Is.....(E-40).....LA  
Swan Is.....(NA-7).....KS4  
Swaziland.....(AF-38).....ZD5  
Sweden.....(E-14).....SL, SM  
Switzerland.....(E-14).....HB  
Syria.....(A-20).....YK

Taiwan (Formosa).....(A-24).....BV  
Tanzania.....(AF-37).....5H3  
Tasmania.....(O-30).....VK7  
Thailand.....(A-26).....HS  
Tibet.....(A-23).....AC4  
Timor Is. (Portuguese).....(O-28).....CR8  
Tinian Is.....(O-27).....KG6T  
Togo.....(AF-35).....5V  
Tokelau Is.....(O-31).....ZM7  
Tonga (Friendly) Is.....(O-32).....VR5  
Trinidad & Martin Vaz Is. (SA-11).....PY0  
Trinidad & Tobago Is.....(SA-9).....9Y4  
Tristan de Cunha & Gough.....(AF-38).....ZD9  
Tromelin Is.....(AF-39).....FB8  
Trucial Oman.....(A-21).....MP4T  
Tunisia.....(AF-33).....3V8  
Turkey.....(A-20).....TA, TC  
Turks & Caicos Is.....(NA-8).....VP5

Uganda.....(AF-37).....5X5  
United Nations, Geneva.....(E-14).....4U1  
United States of America.....(NA-3, 4, 5).....W, K  
Upper Volta.....(AF-35).....XT2  
Uruguay.....(SA-13).....CX

Vatican City.....(E-15).....HV  
Venezuela.....(SA-9).....YV  
Vietnam.....(A-26).....3W8  
Virgin Is.....(NA-8).....KV4  
Volcano & Bonin Is.....(A-27).....KG6I

Wake Is.....(O-31).....KW6  
Wales.....(E-14).....GW  
Wallis & Futuna Is.....(O-32).....FW8  
Windward Is. (Br. W. Indies) (NA-8).....VP2

Yemen.....(A-21).....4W1  
Yugoslavia.....(E-15).....YT, YU

Zambia (N. Rhodesia).....(AF-36).....9J  
Zanzibar.....(AF-37).....VQ1



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# A. R. R. L. COUNTRIES LIST

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AC3.....	Siikim	KG6.....	Marcus Island	VP9.....	Bermuda Islands
AC4.....	Tibet	KG6.....	Mariana Islands	VQ1.....	Zanzibar
AC5, AC7.....	Bhutan	KG6.....	Bonin & Volcano Islands	VQ2 (See 9J2)	
AP.....	East Pakistan	KG6.....	Hawaiian Islands	VQ3 (See 5H3)	
AP.....	West Pakistan	KG6.....	Kure Island	VQ4 (See 5Z4)	
		KG6.....	Johnston Island	VQ5 (See 5X5)	
BV, (C3).....	Formosa	KL7.....	Alaska	*VQ6.....	British Somaliland
BY, (C).....	China	KM6.....	Midway Islands	VQ8.....	Agalega & St. Brandon
		KP4.....	Puerto Rico	VQ8.....	Chagos Islands
*C9.....	Manchuria	KP6.....	Palmyra Group, Jarvis Is.	VQ8.....	Mauritius
CE.....	Chile	KR6.....	Ryukyu Islands	VQ8.....	Rodriguez Island
CE9, KC4, LU-Z, VK0, VP8, OR4, etc.	Antarctica	KS4B.....	Serrana Bank & Roncador Cay	VQ9.....	Aldabra Is.
CE9 (See VP8)		KS6.....	American Samoa	VQ9.....	Seychelles
CE9A.....	Easter Island	KV4.....	Virgin Islands	VR1.....	British Phoenix Islands
CE9Z.....	Juan Fernandez arch.	KW6.....	Wake Island	VR1.....	Gilbert & Ellice Is. & Ocean Island
CM, CO.....	Cuba	KX6.....	Marshall Islands	VR2.....	Fiji Islands
*CM2.....	Tangier	KZ5.....	Canal Zone	VR3.....	Fanning & Christmas Is.
CN2, 8, 9.....	Morocco	LA.....	Bouvet Island	VR4.....	Solomon Islands
CP.....	Bolivia	LA.....	Jan Mayen	VR5.....	Tonga Islands
CR4.....	Cape Verde Islands	LA.....	Norway	VR6.....	Pitcairn Island
CR5.....	Portuguese Guinea	LA.....	Svalbard	*V51.....	Singapore
CR5.....	Principe, Sao Thome	LU.....	Argentina	V51, 9M2 (See 9M2, 4)	
CR6.....	Angola	LU-Z (See CE9)		V52 (See 9M2)	
CR7.....	Mozambique	LX.....	Luxembourg	*V54.....	Sarawak
*CR8.....	Damao, Diu	LZ.....	Bulgaria	V54, ZC5 (See 9M6, 8)	
*CR8.....	Goa			V56.....	Brunei
CR8, CR10.....	Portuguese Timor	M1, 9A1.....	San Marino	V56.....	Hong Kong
CR9.....	Macao	MP4.....	Bahrein	V59.....	Aden & Socotra
CT1.....	Portugal	MP4.....	Qatar	V59K.....	Kamran Is.
CT2.....	Azores	MP4M, VS9.....	Sultanate of Muscat & Oman	V59H.....	Kuria Muria Is.
CT3.....	Madeira Islands	MP4.....	Trucial Oman	V59.....	Maldiv Islands
CX.....	Uruguay			V59 (See MP4)	
				VU.....	Andaman & Nicobar Is.
DJ, DL, DM.....	Germany			VU.....	India
DU.....	Philippine Islands	OA.....	Peru	VU.....	Laccadive Islands
		OD5.....	Lebanon		
EA.....	Spain	OE.....	Austria	W (See K)	
EA6.....	Balearic Islands	OH.....	Finland	XE, XF.....	Mexico
EA8.....	Canary Islands	OH0.....	Aland Islands	XF4.....	Revilla Giedgo
EA9.....	Rio de Oro	OK.....	Czechoslovakia	*XT.....	Voltaic Rep.
EA9.....	Spanish Morocco	ON4, 5.....	Belgium	XU.....	Cambodia
EA8.....	Spanish Guinea	OQ5, 0 (See 9Q5)		XV5 (See 3W8)	
EL.....	Republic of Ireland	OX, KG1.....	Greenland	XW8.....	Laos
EL.....	Liberia	OY.....	Faeroe Islands	XZ2.....	Burma
EP.....	Eritrea	OZ.....	Denmark		
*ET2.....	Eritrea			YA.....	Afghanistan
ET3.....	Ethiopia	PA0, P11.....	Netherlands	YL.....	Iraq
		PJ2M.....	Netherlands Antilles	YJ (See FUB)	
F.....	France	*PK.....	Indonesia	YK.....	Syria
F, 7X2, 3.....	Amsterdam & St. Paul Is.	*PK1, 2, 3.....	Java	YN, YN0.....	Nicaragua
F8B.....	Crozet Is.	*PK4.....	Sumatra	Y0.....	Rumania
F8B (See F8B)		*PK5.....	Netherlands Borneo	Y5.....	Salvador
F8B (See 5R8)	Kerguelen Islands	*PK6.....	Celebes & Molucca Islands	YU.....	Yugoslavia
F8B (See FR7)		PX.....	Andorra	YV.....	Venezuela
FC (unofficial).....	Corsica	PY.....	Brazil	YV0.....	Aves Island
FD (See 5V)		PY0.....	Fernando de Noronha		
FE8 (See TJ)		PY0.....	Trindade & Martin Vaz Is.	ZA.....	Albania
FF4 (See TU)		PZ1.....	Surinam	ZB1.....	Malta
FF7 (See 5T)				ZB2 (See VK9)	Gibraltar
FF8 (See TV)		SL, SM.....	Sweden	ZC4 (See 5B4)	
FF8 (See T2)		SP.....	Poland	*ZC5.....	British North Borneo
FF8 (See 5U7)		ST2.....	Sudan	ZC6.....	Palestine
FF8 (See XT)		SU.....	Egypt	ZD1 (See 9L1)	
FF8 (See 6W8)		SV.....	Crete	ZD2 (See 5N2)	
*F8B.....	French West Africa	SV.....	Dodecanese	ZD3.....	The Gambia
FG7.....	Guadeloupe	TA.....	Turkey	ZD4 (See 9G1)	
FH8, F8B.....	Comoro Islands	TF.....	Iceland	*ZD4.....	Gold Coast, Togoland
*F8B.....	French Indo-China	TG.....	Guatemala	ZD6 (See 7Q7)	
FK8.....	New Caledonia	TI.....	Costa Rica	ZD7.....	St. Helena
FL8.....	French Somaliland	TI9.....	Cocos Islands	ZD8.....	Ascension Island
FM7.....	Martinique	TJ.....	Rhodesia	ZD9.....	Tristan da Cunha & Gough Island
*FN.....	French India	*TL.....	Central African Rep.	ZE.....	Rhodesia
F08.....	Clipperton Island	*TN.....	Congo Rep.	ZK1.....	Cook Islands
F08.....	French Oceania	*TR.....	Gabon Rep.	ZK1.....	Manihiki Islands
F08 (See TL)	St. Pierre & Miquelon Is.	*TT.....	Chad Rep.	ZK2.....	Niue
F08 (See TT)		*TU.....	Ivory Coast	ZL.....	Auckland Is. & Campbell Is.
F08 (See TN)		*TY.....	Dahomey Rep.	ZL.....	Chatham Islands
F08 (See TR)		*TZ.....	Mali Rep.	ZL.....	Kermadec Islands
*F08.....	French Equatorial Africa			ZL (See CE9)	New Zealand
*FR7.....	Glorioso Islands	UA1-6, UN1.....	European Russian Socialist Federal Soviet Republic	ZM6.....	Western Samoa
*FR7.....	Juan de Nova	UA1.....	Franz Josef Land	ZM7.....	Tokelau
FR7.....	Ukraine	UA2.....	Kaliningradsk	ZP.....	Paraguay
FR7.....	Tromelin	UB5, UT5.....	Asiatic Russian S.F.S.R.	ZS1, 2, 4, 5, 6.....	South Africa
FS7.....	Saint Martin	UC2.....	White Russian, S.S.R.	ZS2.....	Prince Edward & Marion Is.
FUB, YJ1.....	New Hebrides	UD6.....	Azerbaijan	ZS3.....	Southwest Africa
FUB.....	Wallis & Futuna Islands	UF6.....	Georgia	ZS7.....	Swaziland
FY7.....	French Guiana & Inini	UG6.....	Armenia	ZS8.....	Basutoland
		UI8.....	Turkmenistan	ZS9.....	Bechuanaland
		UL8.....	Uzbek		
G.....	England	UL7 (See CE9)	Kazakh	3A.....	Monaco
GC.....	Guernsey & Dependencies	UM8.....	Kirghiz	3VB.....	Tunisia
GC.....	Jersey Island	*UN1.....	Karelo-Finnish Republic	3WB, XV5.....	Vietnam
GD.....	Isle of Man	U05.....	Moldavia		
GI.....	Northern Ireland	UP2.....	Lithuania	4S7.....	Ceylon
GM.....	Scotland	UQ2.....	Latvia	4U1.....	I.T.U., Geneva
GW.....	Wales	UR2.....	Estonia	4W1.....	Yemen
				4X4.....	Israel
HA.....	Hungary	VE, V0.....	Canada	5A.....	Libya
HB.....	Switzerland	VK.....	Australia (Inc. Tasmania)	5B4, ZC4.....	Cyprus
HC8.....	Galapagos Islands	VK.....	Lord Howe Island	5H3, VQ3.....	Tanganyika
HE, HB0.....	Liechtenstein	VK4.....	Willis Islands	5N2, ZD2.....	Nigeria
IH.....	Haiti	VK9, ZC3.....	Christmas Island	5R8, FB8.....	Malagasy Rep.
HI.....	Dominican Republic	VK9.....	Cocos Islands	*ST.....	Mauritania
HK.....	Colombia	VK9.....	Nauru Island	*SU7.....	Niger Rep.
HK0.....	Bajo Nuevo	VK9.....	Norfolk Island	5U7.....	Togo Rep.
HK0.....	Malpelo Is.	VK9.....	Papua Territory	5X5, VQ5.....	Uganda
HK0.....	San Andres & Providencia	VK9 (See CE9)	Territory of New Guinea	5Z4, VQ4.....	Kenya
HL, HM.....	Korea	VK0 (See CE9)	Heard Island	601, 2, 6.....	Somali Rep.
HP.....	Panama	*V0 (See VE)	Macquarie Island	*6WB, FF8.....	Senegal Rep.
HS.....	Honduras	VP1.....	British Honduras	6Y5, VP5.....	Jamaica
HV.....	Vatican	*VP2.....	Anguilla		
HZ, 7Z.....	Saudi Arabia	*VP2.....	Antigua, Barbuda	7G1.....	Rep. of Guinea
		*VP2.....	British Virgin Islands	7Q7 (ZD6).....	Malawi
IL, IT1.....	Italy	*VP2.....	Dominica	7X2, 3 (See FA)	
*I1.....	Trieste	*VP2.....	Grenada & Dependencies	7Z (See HZ)	
*I5.....	Italian Somaliland	*VP2.....	Montserrat		
IS1.....	Sardinia	*VP2.....	St. Kitts, Nevis	BZ4.....	Saudi Arabia/Iraq Neutral Zone
		*VP2.....	St. Lucia	BZ5 (See 9K3)	
JA, KA.....	Japan	*VP2.....	St. Vincent & Dependencies		
JT1.....	Mongolia	VP4.....	British Guiana	9A1 (See M1)	
JY.....	Jordan	VP5.....	Trinidad & Tobago	*9G1, ZD4.....	Ghana
*JZ0.....	Netherlands New Guinea	VP5 (See 6Y5)	Cayman Islands	9J2, VQ2.....	Zambia
		VP5.....	Turks & Caicos Islands	9K3, 8Z5.....	Kuwait
K, W.....	United States of America	VP6.....	Barbados	9L1, ZD1.....	Kuwait/Saudi Arabia Neutral Zone
KA (See JA)		VP6.....	Bahama Islands	*9M2.....	Sierra Leone
KB6.....	Baker, Howland & American Phoenix Islands	VP8 (See CE9)	Falkland Islands	*9M2, 4.....	West Malaysia
KC4.....	Navassa Island	VP8, LU-Z.....	So. Georgia Is.	*9M6, 8.....	East Malaysia
KC6.....	Eastern Caroline Is.	VP8, LU-Z.....	So. Orkney Is.	9N1.....	Nepal
KC6.....	Western Caroline Is.	VP8, LU-Z, CE9.....	So. Sandwich Is.	9Q5, 0Q5, 0.....	Rep. of the Congo
KG1 (See OX)			So. Shetland Is.	*9S4.....	Saar
KG4.....	Guantanamo Bay			*9U5.....	Burundi
KG6.....	Guam			*9U5.....	Ruanda-Urundi
				*9X5.....	Rwanda



## FEDERAL COMMUNICATIONS COMMISSION EXAMINATION POINTS

Examinations for commercial and amateur radio operator licenses are conducted at the following F.C.C. field offices on the days designated by the Engineer in Charge of each office. Specific dates should be obtained from the Engineer in Charge.

Dist. No.	Office Location
1	BOSTON, MASSACHUSETTS 02109 1600 Customhouse
2	NEW YORK, NEW YORK 10014 748 Federal Building, 641 Washington Street
3	PHILADELPHIA, PENNSYLVANIA 19106 1005 New U. S. Customhouse
4	BALTIMORE, MARYLAND 21202 415 U. S. Customhouse, Gay and Water Streets
5	NORFOLK, VIRGINIA 23510 405 Federal Building
6	ATLANTA, GEORGIA 30303 2010 Atlanta Merchandise Mart, 240 Peachtree St., NE
6S	SAVANNAH, GEORGIA 31402 238 Post Office Building, Box 77
7	MIAMI, FLORIDA 33101 51 S. W. First Av., Room 919
7T	TAMPA, FLORIDA 33602 759 Federal Office Bldg., 500 Zack Street
8	NEW ORLEANS, LOUISIANA 70130 608 Federal Office Building, 600 South Street
8M	MOBILE, ALABAMA 36602 439 U. S. Court & Customhouse
9	HOUSTON, TEXAS 77002 5636 New Federal Office Building, 515 Rusk Avenue
9B	BEAUMONT, TEXAS 77704 301 Post Office Building, 300 Willow Street
10	DALLAS, TEXAS 75202 1314 Wood Street, Room 707
11	LOS ANGELES, CALIFORNIA 90014 Room 50 Mezzanine Floor, 849 South Broadway
11SD	SAN DIEGO, CALIFORNIA 92101 Fox Theatre Building, 1245 Seventh Avenue
12	SAN FRANCISCO, CALIFORNIA 94126 323A Customhouse, 555 Battery Street
13	PORTLAND, OREGON 97205 441 New U. S. Courthouse, 620 S. W. Main Street
14	SEATTLE, WASHINGTON 98104 806 Federal Office Building, 1st Avenue and Marion St.
15	DENVER, COLORADO 80202 521 New Customhouse, 19th bet. California and Stout St.
16	ST. PAUL, MINNESOTA 55102 208 Federal Courts Building, 6th and Market Streets
17	KANSAS CITY, MISSOURI 64106 3100 Federal Office Building, 911 Walnut Street
18	CHICAGO, ILLINOIS 60604 1872 U.S. Courthouse. 219 S Dearborn St.
19	DETROIT, MICHIGAN 48226 1029 Federal Building
20	BUFFALO, NEW YORK 14203 328 Post Office Building, Ellicott and Swan Streets
21	HONOLULU, HAWAII 96808 502 Federal Building, 335 South King Street
22	SAN JUAN, PUERTO RICO 00903 322-323 U.S. Post Office & Courthouse
23	ANCHORAGE, ALASKA 99501 55 U. S. Post Office Building, Box 644
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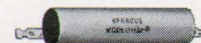
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# INTERNATIONAL "Q" SIGNALS

Abbreviation	Question	Answer or Advice	Abbreviation	Question	Answer or Advice
QRA	What is the name of your station?	The name of my stations is . . .	QSY	Shall I change to transmission on another frequency?	Change to transmission on another frequency [or on . . . kc/s (or Mc/s)].
QRB	How far approximately are you from my station?	The approximate distance between our stations is . . . nautical miles (or kilometres)	QSZ	Shall I send each word or group more than once?	Send each word or group twice (or . . . times).
QRD	Where are you bound and where are you from?	I am bound for . . . from . . .	QTA	Shall I cancel telegram number . . . as if it had not been sent?	Cancel telegram number . . . as if it had not been sent.
QRG	Will you tell me my exact frequency or that of . . .?	Your exact frequency (or that of . . . is . . . kc/s (or Mc/s).	QTB	Do you agree with my counting of words?	I do not agree with your counting of words; I will repeat the first letter or digit of each word or group.
QRH	Does my frequency vary?	Your frequency varies.	QTC	How many telegrams have you to send?	I have . . . telegrams for you (or for . . .).
QRI	How is the tone of my transmission?	The tone of your transmission is . . . (1. Good; 2. Variable; 3. Bad).	QTE	What is my TRUE bearing from you?  What is my TRUE bearing from . . . (call sign)?	Your TRUE bearing from me is . . . degrees (at . . . hours)  Your TRUE bearing from . . . (call sign) was . . . degrees (at . . . hours)
QRK	What is the readability of my signals (or those of . . .)?	The readability of your signals (or those of . . .) is . . . (1. Unreadable; 2. Readable now and then; 3. Readable, but with difficulty; 4. Readable; 5. Perfectly readable).	QTH	What is the TRUE bearing of . . . (call sign) from . . . (call sign)?	The TRUE bearing of . . . (call sign) from . . . (call sign) was . . . degrees (at . . . hours).
QRL	Are you busy?	I am busy (or I am busy with . . .). Please do not interfere.	QTI	Will you send two dashes of ten seconds each followed by your call sign (repeated . . . times) [on . . . kc/s (or Mc/s)]?	I am going to send two dashes of ten seconds each followed by my call sign (repeated . . . times) [on . . . kc/s (or Mc/s)]
QRM	Are you being interfered with?	I am being interfered with.	QTL	Will you request . . . to send two dashes of ten seconds followed by his call sign (repeated . . . times) on . . . kc/s (or Mc/s)?	I have requested . . . to send two dashes of ten seconds followed by his call sign (repeated . . . times) on . . . kc/s (or Mc/s).
QRN	Are you troubled by static?	I am troubled by static.	QTN	What is your position in latitude and longitude (or according to any other indication)?	My position is . . . latitude . . . longitude (or according to any other indication).
QRO	Shall I increase power?	Increase power.	QTO	What is your TRUE track?	My TRUE track is . . . degrees.
QRP	Shall I decrease power?	Decrease power.	QTP	What is your speed?	My speed is . . . knots (or kilometres per hour).
QRQ	Shall I send faster?	Send faster (. . . words per minute).	QTR	What is your TRUE heading?	My TRUE heading is . . . degrees.
QRR	Are you ready for automatic operation?	I am ready for automatic operation. Send at . . . words per minute.	QTS	At what time did you depart from . . . (place)?	I departed from . . . (place) at . . . hours.
QRS	Shall I send more slowly?	Send more slowly (. . . words per minute).	QTV	Have you left dock (or port)?	I have left dock (or port)
QRT	Shall I stop sending?	Stop sending.	QTX	Are you airborne?	I am airborne.
QRU	Have you anything for me?	I have nothing for you.	QUA	Are you going to enter dock (or port)?	I am going to enter dock (or port)
QRV	Are you ready?	I am ready.	QUB	Are you going to alight (or land)?	I am going to alight (or land).
QRW	Shall I inform . . . that you are calling him on . . . kc/s (or Mc/s).	Please inform . . . that I am calling him on . . . kc/s (or Mc/s).	QUC	Can you communicate with my station by means of the International Code of Signals?	I am going to communicate with your station by means of the International Code of Signals.
QRX	When will you call me again?	I will call you again at . . . hours [on . . . kc/s (or Mc/s)].	QUD	What is the correct time?	The correct time is . . . hours.
QRY	What is my turn?	Your turn is Number . . . (Relates to communication.)	QUE	Will you send your call sign for . . . minute(s) now (or at . . . hours) [on . . . kc/s (or Mc/s)] so that your frequency may be measured?	I will send my call sign for . . . minute(s) now (or at . . . hours) [on . . . kc/s (or Mc/s)] so that my frequency may be measured.
QRZ	Who is calling me?	You are being called by . . . [on . . . kc/s (or Mc/s)].	QUG	What are the hours during which your station is open?	My station is open from . . . to . . . hours.
QSA	What is the strength of my signals (or those of . . .)?	The strength of your signals (or those of . . .) is . . . (1. Scarcely perceptible; 2. Weak; 3. Fairly good; 4. Good; 5. Very good).	QUT	Shall I stand guard for you on the frequency of . . . kc/s (or Mc/s) (from . . . to . . . hours)?	Stand guard for me on the frequency of . . . kc/s (or Mc/s) (from . . . to . . . hours).
QSB	Are my signals fading?	Your signals are fading.	QUV	Will you keep your station open for further communication with me until further notice (or until . . . hours)?	I will keep my station open for further communication with you until further notice (or until . . . hours).
QSD	Is my keying defective?	Your keying is defective.	QUW	Have you news of . . . (call sign)?	Here is news of . . . (call sign).
QSG	Shall I send . . . telegrams at a time?	Send . . . telegrams at a time.	QUX	Can you give me, in the following order, information concerning: visibility, height of clouds, direction and velocity of ground wind at . . . (place of observation)?	Here is the information requested . . .
QSH	What is the charge to be collected per word to . . . including your internal telegraph charge?	The charge to be collected per word to . . . including my internal telegraph charge is . . . francs.	QUY	What is the number (or other indication) of the last message you received from me [or from (call sign)]?	The number (or other indication) of the last message I received from you [or from . . . (call sign)] is . . .
QSK	Can you hear me between your signals?	I can hear you between my signals.	QUZ	Have you received the urgency signal sent by . . . (call sign of mobile station)?	I have received the urgency signal sent by . . . (call sign of mobile station) at . . . hours.
QSL	Can you acknowledge receipt?	I am acknowledging receipt.	QVA	Have you received the distress signal sent by . . . (call sign of mobile station)?	I have received the distress signal sent by . . . (call sign of mobile station) at . . . hours.
QSM	Shall I repeat the last telegram which I sent you, or some previous telegram?	Repeat the last telegram which you sent me [or telegram(s) number(s) . . .].	QVB	Will you be forced to alight (or land)?	I am forced to alight (or land immediately.
QSN	Did you hear me [or . . . (call sign)] on . . . kc/s (or Mc/s)?	I did hear you [or . . . (call sign)] on . . . kc/s (or Mc/s).	QVC	Will you be forced to alight (or land) at . . . (position or place)?	I shall be forced to alight (or land) at . . . (position or place).
QSO	Can you communicate with . . . direct or by relay?	I can communicate with . . . direct (or by relay through . . .).	QVD	Will you give me the present barometric pressure at sea level?	The present barometric pressure at sea level is . . . (units).
QSP	Will you relay to . . . free of charge?	I will relay to . . . free of charge.			
QSQ	Have you a doctor on board [or is . . . (name of person) on board]?	I have a doctor on board [or . . . (name of person) is on board].			
QSU	Shall I send or reply on this frequency [or on . . . kc/s (or Mc/s)] (with emissions of class . . .)?	Send or reply on this frequency [or on . . . kc/s (or Mc/s)] (with emissions of class . . .).			
QSV	Shall I send a series of V's on this frequency [or . . . kc/s (or Mc/s)]?	Send a series of V's on this frequency [or . . . kc/s (or Mc/s)].			
QSW	Will you send on this frequency [or on . . . kc/s (or Mc/s)] (with emissions of class . . .)?	I am going to send on this frequency [or on . . . kc/s (or Mc/s)] (with emissions of class . . .).			





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**RADIO AMATEUR CALLBOOK**

4844 W. Fullerton Avenue Chicago, Illinois 60639



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	AMSTERDAM, HOLLAND	ANCHORAGE, ALASKA	ASUNCION, PARAGUAY	AUCKLAND, NEW ZEALAND	BOGOTA, COLOMBIA	BOMBAY, INDIA	BERN, SWITZERLAND	BRUSSELS, BELGIUM	BUENOS AIRES, ARGENTINA	CAIRO, EGYPT	CAPETOWN, SOUTH AFRICA	CARACAS, VENEZUELA	COPENHAGEN, DENMARK	GUATEMALA CITY, GUATEMALA	HAVANA, CUBA	HELSINKI, FINLAND	HONOLULU, I. H.	JOHANNESBURG, SOUTH AFRICA	LA PAZ, BOLIVIA	LIMA, PERU	LONDON, ENGLAND	MADRID, SPAIN	MANILA, PHILIPPINE ISLANDS	MEXICO CITY, MEXICO	MONTEVIDEO, URUGUAY	MONTREAL, CANADA	OSLO, NORWAY	PARIS, FRANCE	PRAGUE, CZECHOSLOVAKIA	QUITO, ECUADOR	RIO DE JANEIRO, BRAZIL	ROME, ITALY	SAN JOSE, COSTA RICA	SANTIAGO, CHILE	SHANGHAI, CHINA	SINGAPORE, MALAYA	STOCKHOLM, SWEDEN	SYDNEY, AUSTRALIA	TOKYO, JAPAN
ATLANTA, GA.	43	325	153	242	160	26	48	45	158	51	114	141	38	198	170	30	280	102	160	170	45	58	329	227	156	32	34	47	42	170	139	51	179	168	336	346	33	254	324
BIRMINGHAM, ALA.	42	325	151	241	155	23	47	44	156	50	113	137	37	191	158	29	279	101	157	167	44	57	327	221	154	36	33	47	42	165	137	50	173	166	334	342	32	253	323
BISMARCK, N. D.	42	315	141	240	143	7	45	43	146	40	97	131	35	162	142	27	261	81	146	154	45	56	317	177	145	84	33	46	39	151	129	46	153	155	325	328	30	256	314
BOSTON, MASS.	51	321	167	253	186	36	56	53	169	60	117	172	45	217	210	36	284	105	177	187	53	68	346	235	168	331	40	56	50	191	153	59	205	181	349	7	39	270	335
BUFFALO, N. Y.	49	320	160	250	172	29	53	51	163	55	112	159	42	203	189	34	279	99	168	178	51	65	338	222	161	54	38	53	47	179	146	56	189	173	342	356	37	266	329
CHARLESTON, W. VA.	46	322	156	246	167	28	50	47	160	53	113	151	40	201	183	32	279	101	164	174	48	61	334	224	159	37	36	50	45	175	143	53	185	170	339	351	35	259	327
CHEYENNE, WYO.	38	322	138	236	135	3	41	40	143	37	100	122	32	151	127	24	263	84	141	148	41	52	312	166	142	69	30	42	36	143	126	42	144	152	322	321	27	250	312
CHICAGO, ILL.	45	320	152	245	158	21	49	47	156	49	108	144	39	186	165	31	274	95	158	167	48	60	328	207	154	66	36	50	44	167	138	51	173	166	335	343	34	260	323
CLEVELAND, OHIO	47	320	157	247	167	27	52	49	161	53	111	153	41	198	182	33	278	99	165	174	50	63	334	219	159	53	37	52	46	175	143	54	184	171	340	352	36	263	327
COLUMBIA, S. C.	44	324	156	243	166	29	49	46	161	53	115	148	39	206	186	31	281	103	164	175	46	59	333	232	159	24	35	48	44	175	142	52	187	171	339	352	34	255	327
DALLAS, TEXAS	39	326	142	237	138	12	43	41	148	44	110	122	34	161	123	26	274	97	146	154	42	53	317	189	147	48	31	43	38	149	130	45	150	157	326	326	29	249	317
DENVER, COLORADO	38	323	137	235	133	2	41	39	143	37	101	120	32	149	124	24	264	85	141	147	41	52	312	164	142	66	29	42	35	142	125	42	142	152	321	320	27	249	312
DES MOINES, IOWA	43	320	146	242	149	15	47	44	151	45	105	135	37	173	149	28	270	90	152	160	46	58	323	194	150	68	34	47	41	158	134	48	162	161	330	335	32	256	319
DETROIT, MICH.	47	320	156	247	166	25	51	49	160	52	110	151	41	195	178	32	277	97	163	173	50	63	333	216	159	62	37	52	46	173	142	54	182	169	339	350	35	263	326
EL PASO, TEXAS	36	329	135	233	125	1	39	37	142	37	108	111	30	136	106	22	270	94	137	142	38	49	308	150	140	52	27	40	34	135	124	41	131	149	319	313	25	245	312
HELENA, MONTANA	36	318	133	233	130	355	39	38	138	31	89	119	30	144	124	22	252	71	136	142	39	49	308	154	137	78	28	40	33	138	121	39	138	147	317	316	25	249	307
HOUSTON, TEXAS	39	328	143	237	137	15	43	41	149	45	113	120	34	162	116	26	277	100	147	154	41	53	317	199	147	41	30	43	38	149	130	46	150	158	327	326	29	247	318
INDIANAPOLIS, IND.	45	321	153	244	160	23	49	47	157	50	110	144	39	190	168	31	276	97	160	169	47	60	329	212	155	54	35	49	43	168	139	52	176	167	336	345	34	259	324
JACKSONVILLE, FLA.	42	326	155	242	163	30	48	44	160	53	117	142	37	209	185	30	283	105	163	173	44	57	331	239	158	20	33	47	42	174	141	51	187	170	338	350	33	251	326
KANSAS CITY, MO.	42	322	145	240	146	14	45	43	151	45	107	132	36	171	143	28	271	93	151	159	44	56	321	193	149	61	33	46	40	156	133	47	159	160	329	333	31	254	319
LITTLE ROCK, ARK.	41	325	146	240	147	17	45	43	152	47	111	130	36	175	141	28	275	98	152	160	43	56	322	203	150	47	32	45	40	157	134	48	161	161	330	334	31	252	320
LOS ANGELES, CALIF.	31	333	127	228	116	347	34	33	135	28	102	104	26	121	100	18	260	84	128	132	34	44	300	126	134	58	24	35	28	124	117	34	119	141	312	303	21	241	306
LOUISVILLE, KY.	44	322	153	244	160	23	49	46	157	50	111	144	39	191	168	30	277	98	160	169	47	60	329	215	156	47	35	49	43	168	139	51	176	167	336	345	33	257	324
MIAMI, FLORIDA	41	328	155	240	163	33	47	43	160	54	118	138	37	223	217	30	285	108	163	175	43	56	331	254	158	13	33	46	42	176	140	50	194	171	339	351	32	247	327
MILWAUKEE, WIS.	45	319	152	245	158	20	50	47	156	49	107	145	39	185	165	31	273	94	158	167	48	61	328	205	154	72	36	50	44	166	138	52	173	165	335	343	34	261	323
MINNEAPOLIS, MINN.	44	317	147	243	152	15	48	46	152	46	103	139	38	175	154	29	270	90	153	161	47	59	324	193	150	81	35	49	42	160	134	49	164	161	331	337	33	259	319
NASHVILLE, TENN.	43	323	151	242	157	23	48	45	156	50	112	140	38	190	162	30	277	99	158	167	46	58	328	216	155	43	34	48	42	166	138	50	174	166	335	343	33	255	324
NEW ORLEANS, LA.	40	327	147	239	146	21	45	42	153	48	114	127	35	182	133	28	279	102	152	161	43	55	322	220	151	35	32	45	40	158	135	48	163	162	331	334	30	249	321
NEW YORK, N. Y.	49	321	164	251	180	34	54	51	167	58	116	166	43	214	204	35	283	104	173	184	51	66	343	233	165	4	39	54	48	187	150	57	199	177	346	3	38	266	333
NORFOLK, VA.	46	323	161	247	176	33	51	48	165	56	116	160	41	213	203	33	283	104	170	181	48	62	339	235	163	12	36	51	46	184	147	55	197	175	344	0	36	260	331
PHILADELPHIA, PA.	48	322	163	249	178	33	53	50	166	57	115	164	42	212	202	34	282	103	172	182	50	65	341	232	164	11	38	53	48	185	149	56	197	176	345	2	37	264	332
PHOENIX, ARIZONA	34	330	131	231	121	354	37	35	138	33	105	108	28	129	104	20	265	89	133	138	36	47	304	137	137	56	26	38	31	130	121	38	126	146	316	308	23	243	309
PITTSBURGH, PA.	47	321	158	247	170	29	52	49	162	54	113	155	41	203	187	33	279	100	167	176	49	63	336	224	160	41	37	52	46	178	145	55	188	172	341	354	36	262	329
ST. LOUIS, MO.	43	322	149	242	153	19	47	45	154	48	109	137	37	181	156	29	274	96	155	164	46	58	325	204	152	55	34	47	42	162	136	49	167	163	332	339	32	256	321
SALT LAKE CITY, UTAH	35	325	132	232	127	355	38	36	139	32	96	114	29	138	116	21	258	79	135	141	38	48	307	149	136	67	27	39	32	135	121	38	134	146	317	313	24	247	308
SAN FRANCISCO, CALIF.	30	333	125	226	115	343	32	31	132	24	95	104	24	121	101	16	252	74	126	130	33	42	298	126	131	62	22	33	26	123	115	32	119	139	310	301	19	240	303
SEATTLE, WASHINGTON	31	321	125	227	120	345	33	32	131	23	79	110	25	131	113	17	240	58	128	133	34	43	300	138	130	75	24	35	27	128	113	32	127	139	309	306	20	243	301
WASHINGTON, D. C.	47	322	161	248	175	32	52	49	164	56	115	160	41	210	198	33	282	103	170	180	49	63	339	231	163	20	37	52	47	182	147	55	194</						



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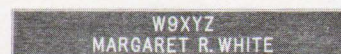
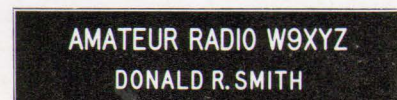
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\$3.75 \$4.25

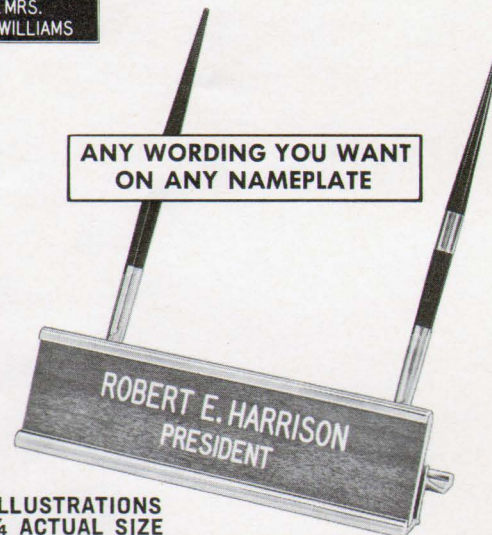
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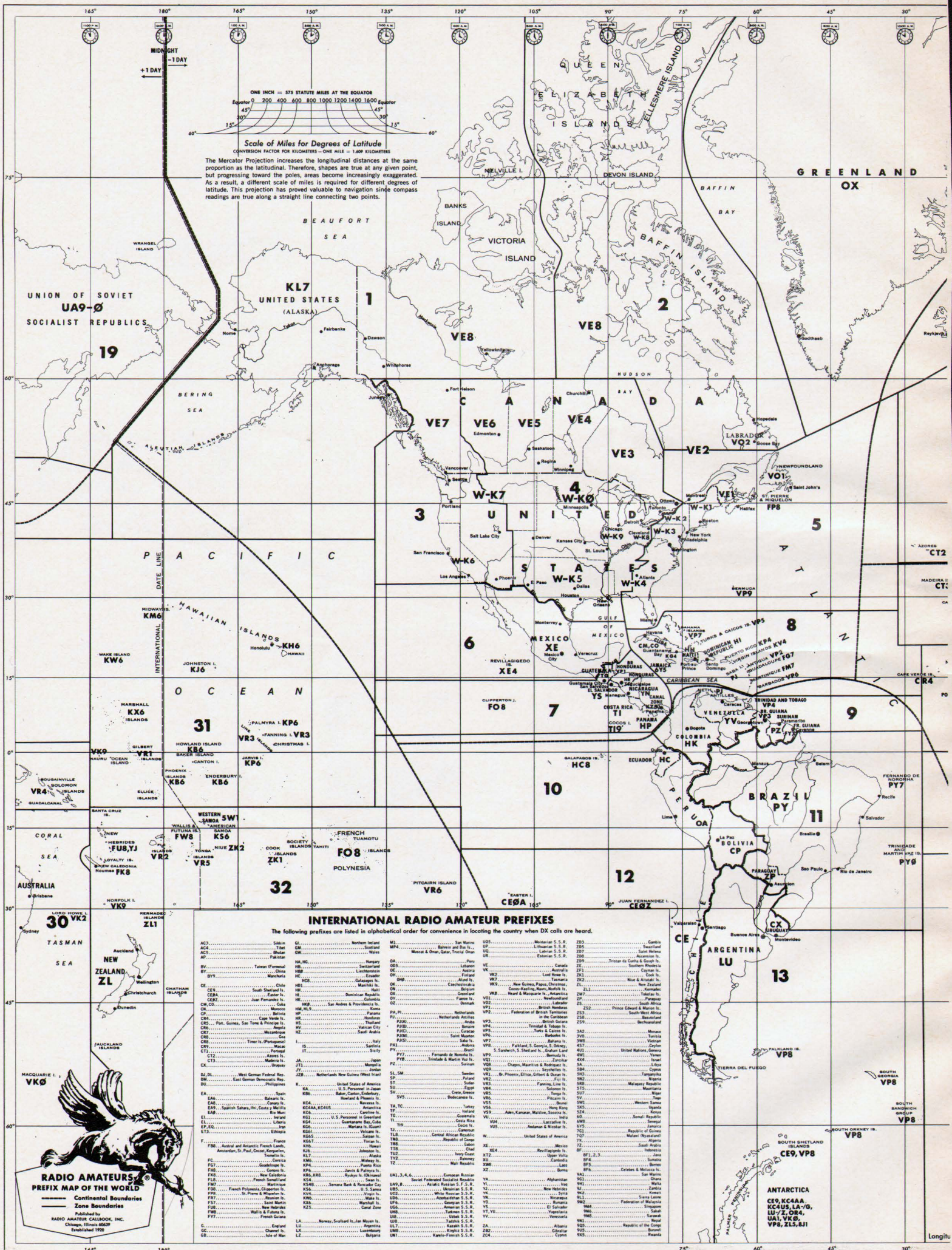
Kind of Nameplate	Color of Nameplate	Line Arrangement. Check one if 2 lines	Color of Holder if Desk or Exec. Set
<input type="checkbox"/> Desk	<input type="checkbox"/> Walnut Grained <input type="checkbox"/> Jet Black	<input type="checkbox"/> All letters same size <input type="checkbox"/> Large letters over small <input type="checkbox"/> Small letters over large	<input type="checkbox"/> Gold <input type="checkbox"/> Silver
<input type="checkbox"/> Door or rig	<input type="checkbox"/> Walnut Grained <input type="checkbox"/> Jet Black	<input type="checkbox"/> All letters same size <input type="checkbox"/> Large letters over small <input type="checkbox"/> Small letters over large	
<input type="checkbox"/> Exec. Desk Set	<input type="checkbox"/> Walnut Grained <input type="checkbox"/> Jet Black	<input type="checkbox"/> All letters same size <input type="checkbox"/> Large letters over small <input type="checkbox"/> Small letters over large	<input type="checkbox"/> Gold <input type="checkbox"/> Silver
<input type="checkbox"/> Lapel Pin	<input type="checkbox"/> Jet Black <input type="checkbox"/> White <input type="checkbox"/> Red <input type="checkbox"/> Blue		

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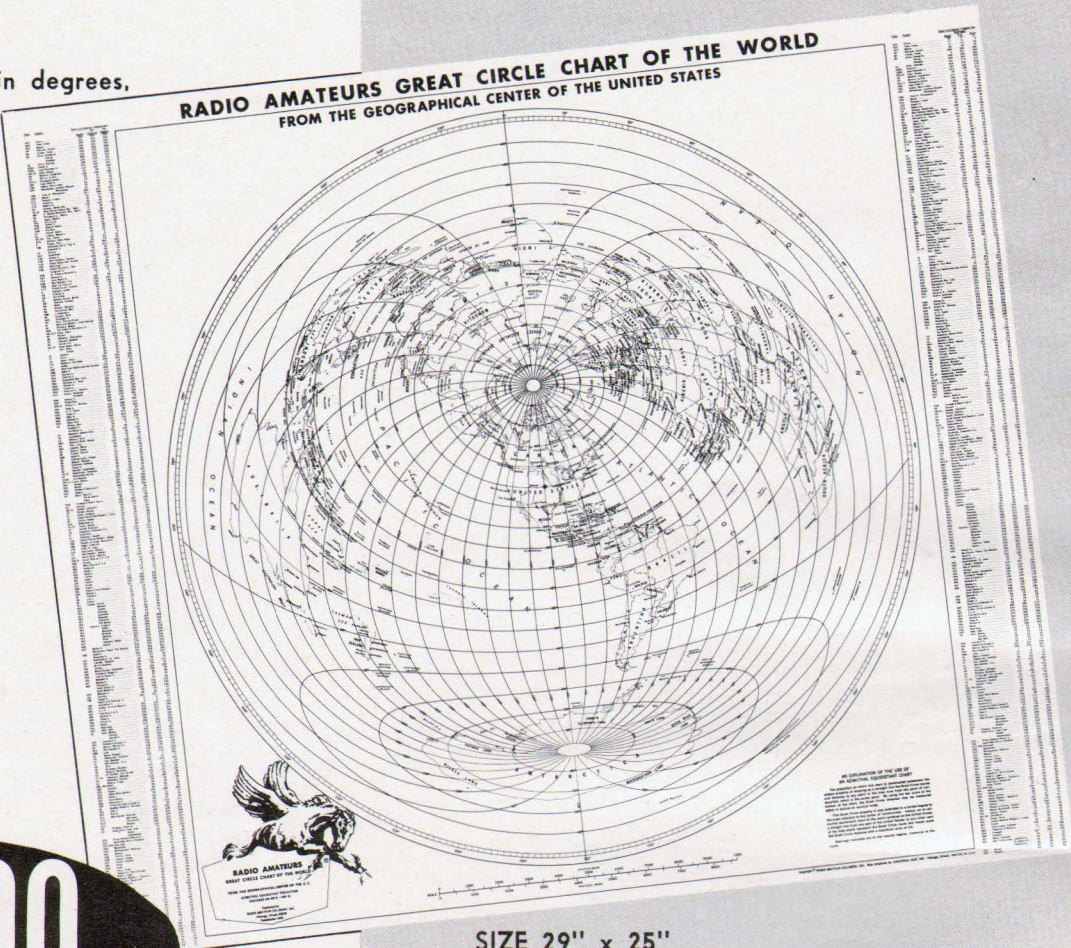
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# 73

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- Which ham magazine gives you the latest technical developments?
- Which ham magazine costs only \$4 per year?

IF YOU CAN ANSWER ALL OF THE ABOVE QUESTIONS CORRECTLY\* YOU ARE ENTITLED TO A SUBSCRIPTION TO 73 AT THE SPECIAL REGULAR PRICE OF \$4 FOR 12 FASCINATING ISSUES!

Name \_\_\_\_\_ Call \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

\*If you don't know the answers you must not be familiar with 73. Send for a free sample.

**73 Magazine Peterborough, New Hampshire 03458**

## DX OPERATING CODE

(For W/VE Amateurs)

Some amateur DXers have caused considerable confusion and QRM in their efforts to work DX stations. The points below, if observed by all W/VE amateurs, will help make DX more enjoyable for all.

1. Call DX only after he calls CQ, QRZ? or signs SK, or 'phone equivalents thereof. Make your calls short.
2. Do not call a DX station:
  - a. On the frequency of the station he is calling until you are sure the QSO is over (SK).
  - b. Because you hear someone else calling him.
  - c. When he signs KN, AR or CL.
  - d. Exactly on his frequency.
  - e. After he calls a directional CQ, unless of course you are in the right direction or area.
3. Keep within frequency band limits. Some DX stations can get away with working outside, but you cannot.
4. Observe calling instructions given by DX stations.  
 Example: "15U" means "call 15 kc. up from my frequency".  
 "15D" means down, etc.
5. Give honest reports. Many DX stations depend on W/VE reports for adjustment of station and equipment.
6. Keep your signal clean. Key clicks, ripple, feedback or splatter give you a bad reputation and may get you a citation from FCC.
7. Listen and call the station you want. Calling CQ DX is not the best assurance that the rare DX will reply.
8. When there are several W or VE stations waiting, avoid asking DX to "listen for a friend". Also avoid engaging him in a rag chew against his wishes.

(For Overseas Amateurs)

To all overseas amateur stations:

In their eagerness to work you, many W and VE amateurs resort to practices which cause confusion and QRM. Most of this is good-intentioned but ill-advised; some of it is intentional and selfish. The key to the cessation of unethical DX operating practices is in your hands. We believe that your adoption of certain operating habits will increase your enjoyment of amateur radio and that of amateurs on this side who are eager to work you. We recommend your adoption of the following principles:

1. Do not answer calls on your own frequency.
2. Answer calls from W/VE stations only when their signals are of good quality.
3. Refuse to answer calls from other stations when you are already in contact with someone, and do not acknowledge calls from amateurs who indicate they wish to be "next".
4. Give everybody a break. When many W/VE amateurs are patiently and quietly waiting to work you, avoid complying with requests to "listen for a friend".
5. Tell listeners where to call you by indicating how many kilocycles up (U) or down (D) from your frequency you are listening. Examples: c.w. - "CQ DX CQ DX CQ DX 15U DE AC4YN AC4YN AC4YN 15U K"; 'phone - "Answer 15 kilocycles up from my frequency".
6. Use the ARRL-recommended ending signals, especially KN, to indicate to impatient listeners the status of the QSO. (KN means "Go ahead (specific station), all others keep out".
7. Let it be known that you avoid working amateurs who are constant violators of the above principles.

ARRL Communications Department



# WORLD TIME CONVERSION CHART IN HOURS

Greenwich Meridian Time. London, Eng- land.	Central Europe, Ber- lin, Geneva, Stock- holm, Vienna.	Eastern Europe, Ath- ens, Cape Town, Cairo, Moscow	Arabia, Armenia, Ethiopia, Madagas- car.	Mauritius, Persia, Reunion Island.	Central Russia, Bom- bay, India.	Calcutta, Novosi- birsk Russia, Tibet.	French Indo China. Siam, Sumatra.	Philippine Islands. Perth, Australia.	Central Australia. Tokyo, Japan.	Eastern Australia. Melbourne, Sydney.	New Caledonia. New Zealand.	International Date Line. Fiji Islands.	Norfolk, Alaska. Samoa Islands.	Hawaiian Islands. Midway Islands.	Eastern Alaska. Dawson, Juneau.	Pacific Standard Time. Los Angeles, Seattle.	Mountain Standard Time. Calgary, Denver, Phoenix.	Central Standard Time. Chicago, Costa Rica.	Eastern Standard Time. Montreal, New York, Peru.	Atlantic Standard Time. Argentina, Nova Scotia.	Greenland. Rio de Janeiro, Brazil.	Azores.	Iceland. Canary Islands.
0000	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM
0100	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night
0200	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM
0300	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM
0400	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM
0500	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM
0600	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM
0700	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM
0800	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM
0900	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM
1000	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM
1100	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM
1200	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM
1300	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon
1400	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM
1500	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM
1600	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM
1700	6PM	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM
1800	7PM	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM
1900	8PM	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM
2000	9PM	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM
2100	10PM	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM
2200	11PM	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM
2300	Mid Night	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM

With this chart you can convert standard time in any time zone to GMT or tell what time it is in other parts of the world. To correctly use this chart visualize each horizontal line as a complete circle. From your time zone tracing horizontally to the right (Counter Clockwise) it will be tomorrow when you pass midnight and yesterday when you pass the international date line. To the left (Clockwise) it will be yesterday when you pass midnight and tomorrow when you pass the international date line. There is no change in date when you pass both midnight and the international date line going in one direction. For instance at 8 PM in New York Eastern Standard Time it is 2 AM tomorrow in Berlin, Germany and 11 AM tomorrow in Sydney, Australia. Always trace in the shortest direction from your time zone to find what time it is in any other zone. Copyright 1938 Radio Amateur Call Book, Inc., Chicago, USA.



# INTERNATIONAL POSTAL RATES

The following postal rates cover QSL cards, first class letters and air mail letters to Countries outside of the United States and Possessions.

First class rates are the rate for the first ounce. If the rate indicated is 11¢, add 7¢ for each additional ounce or fraction; if the rate indicated is 5¢, add 5¢ for each additional ounce or fraction.

Air mail rates are the rate for each half ounce, except where indicated.

International reply coupons of United States issue may be purchased at United States post offices for 15 cents each. Each coupon is exchangeable at a post office in any country for a stamp or stamps representing the international postage on a single rate surface letter. The column marked "RP" shows the number of international reply coupons required to prepay an air mail letter of the first weight unit from the countries indicated to the United States.

	QSL cards	First class	mail	RP		QSL cards	First class	Air mail	RP		QSL cards	First class	Air mail	RP
Aden.....	.07	.11	.25	5	Gabon.....	.07	.11	.25	2	Niger.....	.07	.11	.25	2
Afghanistan.....	.07	.11	.25	3	Gambia.....	.07	.11	.25	4	Nigeria.....	.07	.11	.25	4
Aland Is. (Finnish).....	.07	.11	.15	2	Germany, Western Zone.....	.07	.11	.15	2	North Borneo (Sabah).....	.07	.11	.25	5
Albania.....	.07	.11	.15	2	Germany, Eastern Zone.....	.07	.11	.15	2	Northern Ireland.....	.07	.11	.15	3
Algeria.....	.07	.11	.15	2	Ghana.....	.07	.11	.25	6	Norway.....	.07	.11	.15	2
Andorra.....	.07	.11	.15	2	Gibraltar (British).....	.07	.11	.15	2					
Angola.....	.07	.11	.25	3	Gilbert and Ellice Is.....	.07	.11	.25	5	Pakistan.....	.07	.11	.25	4
Argentina.....	.07	.11	.15	2	Goa (Portuguese India).....	.07	.11	.25	3	Panama.....	.07	.11	.13	2
Ascension Is. (British).....	.07	.11	.15	3	Great Britain.....	.07	.11	.15	3	Papua Territory (Australian).....	.07	.11	.25	3
Australia.....	.07	.11	.25	3	Greece (incl. Crete).....	.07	.11	.15	2	Paraguay.....	.07	.11	.15	3
Austria.....	.07	.11	.15	2	Greenland (Danish).....	.07	.11	.15	2	Persian Gulf Ports.....	.07	.11	.25	4
Azores Is. (Portuguese).....	.07	.11	.15	2	Guadaloupe Is.....	.07	.11	.13	2	Peru.....	.07	.11	.15	2
					Guatemala.....	.07	.11	.13	2	Philippines.....	.07	.11	.25	3
Bahama Is. (British).....	.07	.11	.13	2	Guinea, Portuguese.....	.07	.11	.25	2	Pitcairn Is. (British).....	.07	.11	.25	2
Balearic Is. (Spanish).....	.07	.11	.15	2	Guinea, Republic of.....	.07	.11	.25	2	Poland.....	.07	.11	.15	2
Barbados Is. (West Indies).....	.07	.11	.13	3					Portugal.....	.07	.11	.15	2	
Bechuanaland.....	.07	.11	.25	5	Haiti.....	.07	.11	.13	5	Reunion Is. (French).....	.07	.11	.25	3
Belgium.....	.07	.11	.15	2	Honduras.....	.07	.11	.13	3	Rhodesia (Southern Rhodesia).....	.07	.11	.25	5
Bermuda Is.....	.07	.11	.13	2	Hong Kong.....	.07	.11	.25	5	Rio de Oro (Spanish Sahara).....	.07	.11	.25	2
Bolivia.....	.07	.11	.15	2	Hungary.....	.07	.11	.15	3	Rio Muni (Spanish).....	.07	.11	.25	3
Brazil.....	.07	.11	.15	4					Rumania.....	.07	.11	.15	3	
British Guiana.....	.07	.11	.15	4	Iceland.....	.07	.11	.15	2	Rwanda.....	.07	.11	.25	2
British Honduras.....	.07	.11	.13	2	Ifni (Spanish).....	.07	.11	.25	2	Ryukyu Is. (U.S.).....	.07	.11	.25	5
Brunei.....	.07	.11	.25	7	India.....	.07	.11	.25	4					
Bulgaria.....	.07	.11	.15	2	Indonesia.....	.07	.11	.25	4	St. Helena Is. (British).....	.07	.11	.25	3
Burma.....	.07	.11	.25	4	Iran.....	.07	.11	.25	3	St. Pierre and Miquelon Is. (Fr.).....	.07	.11	.13	2
Burundi.....	.07	.11	.25	3	Iraq.....	.07	.11	.25	2	Samoa, Western (British).....	.07	.11	.25	4
					Ireland.....	.07	.11	.15	3	Sarawak.....	.07	.11	.25	4
Cambodia.....	.07	.11	.25	3	Israel.....	.07	.11	.25	3	Saudi Arabia.....	.07	.11	.25	2
Cameroun.....	.07	.11	.25	2	Italy.....	.07	.11	.15	2	Senegal.....	.07	.11	.25	2
Canada.....	.04	.05	.08*	2	Ivory Coast.....	.07	.11	.25	2	Seychelles Is. (British).....	.07	.11	.25	4
Canary Is. (Spanish).....	.07	.11	.15	2	Jamaica.....	.07	.11	.13	2	Sierra Leone.....	.07	.11	.25	4
Cape Verde Is. (Portuguese).....	.07	.11	.25	3	Japan.....	.07	.11	.25	2	Solomon Is. (British).....	.07	.11	.25	6
Caribbean, Federation of British Territories in the.....	.07	.11	.13	2	Jordan.....	.07	.11	.25	3	Somali Republic.....	.07	.11	.25	4
Cayman Is. (West Indies).....	.07	.11	.13	3					South Africa.....	.07	.11	.25	5	
Central African Republic.....	.07	.11	.25	2	Kenya.....	.07	.11	.25	5	South-West Africa.....	.07	.11	.25	5
Ceylon.....	.07	.11	.25	5	Korea.....	.07	.11	.25	3	Spain.....	.07	.11	.15	2
Chad.....	.07	.11	.25	2	Kuwait.....	.07	.11	.25	4	Sudan.....	.07	.11	.25	3
Chile.....	.07	.11	.15	2					Surinam (Netherlands Guiana).....	.07	.11	.15	1	
China (Taiwan).....	.07	.11	.25	3	Laos.....	.07	.11	.25	2	Sweden.....	.07	.11	.15	2
China (Mainland).....	.07	.11	.25	3	Latvia (U.S.S.R.).....	.07	.11	.25	2	Switzerland.....	.07	.11	.15	2
Colombia.....	.07	.11	.15	4	Lebanon.....	.07	.11	.25	3	Syria (United Arab Republic).....	.07	.11	.25	3
Comoro Is. (French).....	.07	.11	.25	3	Leeward Is. (British West Indies).....	.07	.11	.13	2					
Congo (Brazzaville).....	.07	.11	.25	2	Liberia.....	.07	.11	.25	5	Tanzania (Tanganyika).....	.07	.11	.25	5
Congo (Leopoldville).....	.07	.11	.25	2	Libya.....	.07	.11	.15	2	Tasmania (Australia).....	.07	.11	.25	3
Cook Is. (New Zealand).....	.07	.11	.25	3	Lithuania (U.S.S.R.).....	.07	.11	.25	2	Thailand.....	.07	.11	.25	3
Corsica (French).....	.07	.11	.15	2	Luxembourg.....	.07	.11	.15	2	Timor (Portuguese).....	.07	.11	.25	4
Costa Rica.....	.07	.11	.13	2					Togo.....	.07	.11	.25	2	
Cuba.....	.07	.11	.13	4	Macao (Portuguese).....	.07	.11	.25	3	Tonga Is. (British).....	.07	.11	.25	3
Cyprus.....	.07	.11	.25	4	Madeira Is. (Portuguese).....	.07	.11	.15	2	Trinidad and Tobago Is. (British).....	.07	.11	.13	3
Czechoslovakia.....	.07	.11	.15	3	Malagasy Republic (Madagascar).....	.07	.11	.25	3	Tristan de Cunha & Gough Is.....	.07	.11	.25	5
					Malawi (Nyasaland).....	.07	.11	.25	5	Tunisia.....	.07	.11	.15	2
Dahomey.....	.07	.11	.25	2	Malaya, Federation of.....	.07	.11	.25	5	Turkey.....	.07	.11	.15	3
Denmark.....	.07	.11	.15	2	Mali Republic.....	.07	.11	.25	2	Turks & Caicos Is. (British).....	.07	.11	.13	2
Dominican Republic.....	.07	.11	.13	2	Malta (British).....	.07	.11	.15	3					
					Martinique (French).....	.07	.11	.13	2	Uganda.....	.07	.11	.25	5
Ecuador.....	.07	.11	.15	3	Mauritania.....	.07	.11	.25	2	U. S. S. R.....	.07	.11	.25	2
Egypt (United Arab Republic).....	.07	.11	.15	2	Mauritius (British).....	.07	.11	.25	3	Upper Volta.....	.07	.11	.25	2
El Salvador.....	.07	.11	.13	2	Mexico.....	.04	.05	.08*	2	Uruguay.....	.07	.11	.15	5
Eritrea (Ethiopia).....	.07	.11	.25	3	Morocco.....	.07	.11	.15	2					
Estonia (U.S.S.R.).....	.07	.11	.25	3	Mozambique.....	.07	.11	.25	3	Vatican City.....	.07	.11	.15	2
Ethiopia.....	.07	.11	.25	3					Venezuela.....	.07	.11	.15	2	
					Nauru Is.....	.07	.11	.25	3	Vietnam.....	.07	.11	.25	3
Faeroe Is. (Danish).....	.07	.11	.15	2	Nepal.....	.07	.11	.25	5					
Falkland Is. (British).....	.07	.11	.15	3	Netherlands.....	.07	.11	.15	2	Windward Is. (British West Indies).....	.07	.11	.13	2
Fiji Is. (British).....	.07	.11	.25	3	Netherlands Antilles.....	.07	.11	.13	1					
Finland.....	.07	.11	.15	2	Neth. New Guinea (W. Irian).....	.07	.11	.25	3	Yemen.....	.07	.11	.25	5
France.....	.07	.11	.15	2	New Caledonia (French).....	.07	.11	.25	2	Yugoslavia.....	.07	.11	.15	2
French Guiana.....	.07	.11	.15	2	New Guinea, N.E. (Australian).....	.07	.11	.25	3					
French Polynesia Is.....	.07	.11	.25	2	New Hebrides Is.....	.07	.11	.25	3	Zambia (Northern Rhodesia).....	.07	.11	.25	5
French Somaliland.....	.07	.11	.25	2	New Zealand.....	.07	.11	.25	3	Zanzibar.....	.07	.11	.25	5
					Nicaragua.....	.07	.11	.13	4					

\* Rate per ounce

QSL cards and Aerogrammes (air letter sheets) may be sent to any country in the world by air mail for 11¢ (exception, QSL cards to Canada and Mexico, 6¢.

These rates include all revisions up to press time of this issue.



# INTERNATIONAL RADIO AMATEUR PREFIXES

The following prefixes are listed in alphabetical order for convenience in locating the country when DX calls are heard.

AC3..... Sikkim	KG6T..... Tinian Is.	VP8..... Falkland, S. Georgia, S. Orkney,
AC4..... Tibet	KH6..... Hawaii	S. Sandwich, S. Shetland Is., Graham Land
AC5..... Bhutan	KJ6..... Johnston Is.	VP9..... Bermuda Is.
AP..... Pakistan	KL7..... Alaska	VQ1..... Zanzibar
	KM6..... Midway Is.	VQ8..... Chagos, Mauritius & Rodriguez Is.
BV..... Taiwan (Formosa)	KP4..... Puerto Rico	VQ9..... Seychelles Is.
BY..... China	KP6..... Jarvis & Palmyra Is.	VR1..... Br. Phoenix, Ellice, Gilbert & Ocean Is.
BY9..... Manchuria	KR6, KR8..... Ryukyu Is. (Okinawa)	VR2..... Fiji Is.
	KS4..... Swan Is.	VR3..... Fanning, Line Is.
CE..... Chile	KS4B..... Serrana Bank & Roncador Cay	VR4..... Solomon Is.
CE9..... South Shetland Is.	KS6..... U. S. Samoa	VR5..... Tonga Is.
CE0A..... Easter Is.	KV4..... Virgin Is.	VR6..... Pitcairn Is.
CE0Z..... Juan Fernandez Is.	KW6..... Wake Is.	VS5..... Brunei
CM, CO..... Cuba	KX6..... Marshall Is.	VS6..... Hong Kong
CN..... Morocco	KZ5..... Canal Zone	VS9..... Aden, Kamarin, Maldive, Socotra Is.
CP..... Bolivia		VU..... India
CR3..... Portuguese Guinea	LA..... Norway, Svalbard Is, Jan Mayen Is.	VU4..... Laccadive Is.
CR4..... Cape Verde Is.	LU..... Argentina	VU5..... Andaman & Nicobar Is.
CR5..... Sao Tome & Principe Is.	LX..... Luxembourg	
CR6..... Angola	LZ..... Bulgaria	W..... United States of America
CR7..... Mozambique		
CR8..... Goa	M1..... San Marino	XE..... Mexico
CR8..... Timor Is. (Portuguese)	MP4..... Bahrein and Das Is.,	XE4..... Revillagigedo Is.
CR9..... Macao	Muscat & Oman, Qatar, Trucial Oman	XT2..... Upper Volta
CT1..... Portugal		XU..... Cambodia
CT2..... Azores Is.	OA..... Peru	XU8..... Laos
CT3..... Madeira Is.	OD5..... Lebanon	XZ..... Burma
CX..... Uruguay	OE..... Austria	
	OH..... Finland	YA..... Afghanistan
DJ, DL..... West German Federal Rep.	OH0..... Aland Is.	YI..... Iraq
DM..... East German Democratic Rep.	OK..... Czechoslovakia	YJ..... New Hebrides
DU..... Philippines	ON..... Belgium	YK..... Syria
	OX..... Greenland	YN..... Nicaragua
EA..... Spain	OY..... Faeroe Is.	YO..... Rumania
EA6..... Balearic Is.	OZ..... Denmark	YS..... El Salvador
EA8..... Canary Is.		YT, YU..... Yugoslavia
EA9..... Spanish Sahara, Ifni, Ceuta y Melilla	PA, PI..... Netherlands	YV..... Venezuela
EA0..... Rio Muni	PJ..... Netherlands Antilles	
EL..... Ireland	PJ(A)..... Aruba	ZA..... Albania
EL..... Liberia	PJ(B)..... Bonaire	ZB2..... Gibraltar
EP, EQ..... Iran	PJ(C)..... Curacao	ZC4..... Cyprus
ET3..... Ethiopia	PJ(M)..... Saint Maarten	ZD3..... Gambia
	PJ(S)..... Saba Is.	ZD5..... Swaziland
F..... France	PX1..... Andorra	ZD7..... Saint Helena
FB8..... Austral and Antarctic French Lands,	PY..... Brazil	ZD8..... Ascension Is.
Amsterdam, St. Paul, Crozet, Kerguelen,	PY7..... Fernando de Noronha Is.	ZD9..... Tristan da Cunha & Gough Is.
Tromelin Is.	PY0..... Trindade & Martin Vaz Is.	ZE..... Southern Rhodesia
FC..... Corsica	PZ..... Surinam	ZF1..... Cayman Is.
FG7..... Guadeloupe Is.		ZK1..... Cook Is.
FG7..... Comoro Is.	SL, SM..... Sweden	ZK2..... Niue Is.
FK8..... New Caledonia	SP..... Poland	ZL..... New Zealand
FL8..... French Somaliland	ST..... Sudan	ZL1..... Kermadec
FM7..... Martinique	SU..... Egypt	ZM7..... Tokelau Is.
F08..... French Polynesia, Clipperton Is.	SV..... Crete, Greece	ZP..... Paraguay
FP8..... St. Pierre & Miquelon Is.	SV5..... Dodecanese Is.	ZS..... South Africa
FR7..... Reunion Is.		ZS2..... Prince Edward & Marion Is.
FR7..... Saint Martin	TA, TC..... Turkey	ZS3..... South-West Africa
FU8..... New Hebrides	TF..... Iceland	ZS8..... Basutoland
FW8..... Wallis & Futuna Is.	TG..... Guatemala	ZS9..... Bechuanaland
FY7..... French Guiana	TI..... Costa Rica	
	TI9..... Cocos Is.	3A2..... Monaco
G..... England	TJ..... Cameroun	3V8..... Tunisia
GC..... Channel Is.	TL8..... Central African Republic	3W8..... Vietnam
GD..... Isle of Man	TN8..... Republic of Congo	4S7..... Ceylon
GI..... Northern Ireland	TR8..... Gabon	4U1..... United Nations, Geneva
GM..... Scotland	TT8..... Chad	4W1..... Yemen
GW..... Wales	TU2..... Ivory Coast	4X4..... Israel
	TY..... Dahomey	5A..... Libya
HA, HG..... Hungary	TZ..... Mali Republic	5B4..... Cyprus
HB..... Switzerland		5H3..... Tanzania
HB0..... Liechtenstein	UA1, 3, 4, 6..... European Russian	5N2..... Nigeria
HC..... Ecuador	Soviet Federated Socialist Republic	5R8..... Malagasy Republic
HC8..... Galapagos Is.	UA9, 0..... Asiatic Russian S. F. S. R.	5T5..... Mauritania
HD1..... Manihiki Is.	UB5..... Ukrainian S. S. R.	5U7..... Niger
HH..... Haiti	UC2..... White Russian S. S. R.	5V..... Togo
HI..... Dominican Republic	UD6..... Azerbaizhan S. S. R.	5W1..... Western Samoa
HK..... Colombia	UF6..... Georgian S. S. R.	5X5..... Uganda
HK0..... San Andres & Providencia Is.	UG6..... Armenian S. S. R.	5Z4..... Kenya
HM, HL9..... Korea	UH8..... Turkmen S. S. R.	60..... Somali Republic
HP..... Panama	UI8..... Uzbek S. S. R.	6W8..... Senegal
HS..... Honduras	UJ8..... Tadzhik S. S. R.	6Y5..... Jamaica
HS..... Thailand	UL7..... Kazakh S. S. R.	7G1..... Republic of Guinea
HV..... Vatican City	UM8..... Kirghiz S. S. R.	7Q7..... Malawi (Nyasaland)
HZ..... Saudi Arabia	UN1..... Karelo-Finnish S. S. R.	7X..... Algeria
	UO5..... Moldavian S. S. R.	7Z..... Saudi Arabia
I..... Italy	UP..... Lithuanian S. S. R.	
IS..... Sardinia	UQ..... Latvian S. S. R.	8F..... Indonesia
IT..... Sicily	UR..... Estonian S. S. R.	8F1, 2, 3..... Java
		8F4..... Sumatra
JA..... Japan	VE..... Canada	8F5..... Borneo
JT1..... Mongolia	VK..... Australia	8F6..... Celebes & Molucca Is.
JY..... Jordan	VK2..... Lord Howe Is.	9A1..... San Marino
JZ0..... Netherlands New Guinea (West Irian)	VK7..... Tasmania	9G1..... Ghana
	VK9..... New Guinea, Papua, Christmas,	9H1..... Malta
K..... United States of America	Cocos-Keeling, Nauru, Norfolk Is.	9J..... Zambia
KA..... U. S. Personnel in Japan	VK0..... Heard & Macquarie Is., Antarctica	9K2..... Kuwait
KB6..... Baker, Canton, Enderbury,	V01..... Newfoundland	9L1..... Sierra Leone
Howland & Phoenix Is.	V02..... Labrador	9M2..... Federation of Malaysia
KC4..... Navassa Is.	VP1..... British Honduras	9M4..... Singapore
KC4AA, KC4US..... Antarctica	VP2..... Federation of British Territories	9M6..... Sabah
KC6..... Caroline Is.	in the Caribbean	9M8..... Sarawak
KG1..... U. S. Personnel in Greenland	VP3..... British Guiana	9N1..... Nepal
KG4..... Guantanamo Bay, Cuba	VP4..... Trinidad & Tobago Is.	9Q5..... Republic of the Congo
KG6..... Mariana Is. (Guam)	VP5..... Turks & Caicos Is.	9U5..... Burundi
KG6L..... Volcano & Bonin Is.	VP6..... Barbados Is.	9X5..... Rwanda
KG6S..... Saipan Is.	VP7..... Bahama Is.	9Y4..... Trinidad & Tobago Is.







# GREAT CIRCLE BEARINGS IN THE UNITED STATES

	ATLANTA, GA.	BIRMINGHAM, ALA.	BISMARCK, N. D.	BOSTON, MASS.	BUFFALO, N. Y.	CHARLESTON, W. VA.	CHEYENNE, WYO.	CHICAGO, ILL.	CLEVELAND, OHIO	COLUMBIA, S. C.	DALLAS, TEXAS	DENVER, COLORADO	DES MOINES, IOWA	DETROIT, MICH.	EL PASO, TEXAS	HELENA, MONTANA	HOUSTON, TEXAS	INDIANAPOLIS, IND.	JACKSONVILLE, FLA.	KANSAS CITY, MO.	LITTLE ROCK, ARK.	LOS ANGELES, CALIF.	LOUISVILLE, KY.	MIAMI, FLORIDA	MILWAUKEE, WIS.	MINNEAPOLIS, MINN.	NASHVILLE, TENN.	NEW ORLEANS, LA.	NEW YORK, N. Y.	NORFOLK, VA.	PHILADELPHIA, PA.	PHOENIX, ARIZONA	PITTSBURGH, PA.	ST. LOUIS, MO.	SALT LAKE CITY, UTAH	SAN FRANCISCO, CALIF.	SEATTLE, WASHINGTON	WASHINGTON, D. C.	WILMINGTON, N. C.
ATLANTA, GA.		264	322	47	24	25	301	343	15	86	269	297	320	7	271	310	251	347	145	306	281	281	347	154	345	331	321	234	48	64	48	278	27	318	296	289	308	48	84
BIRMINGHAM, ALA.	82		326	50	31	40	304	356	26	84	268	299	328	17	270	312	246	5	125	314	287	281	10	142	355	338	0	219	52	67	53	278	37	333	298	290	309	53	83
BISMARCK, N. D.	132	137		92	97	115	209	114	105	124	167	205	133	104	198	273	165	119	132	148	150	233	123	135	109	108	131	151	99	111	102	217	106	134	237	249	282	107	119
BOSTON, MASS.	236	241	291		277	247	278	273	267	226	254	275	275	274	262	293	246	263	220	268	253	273	256	207	278	286	249	237	235	219	233	268	258	262	280	280	295	236	217
BUFFALO, N. Y.	208	217	291	92		206	273	264	237	192	241	269	268	261	252	290	231	243	191	258	237	267	231	184	274	286	225	219	118	160	134	261	199	248	276	276	293	159	174
CHARLESTON, W. VA.	208	223	307	61	24		287	309	359	174	251	282	293	345	260	300	238	293	180	279	251	274	270	174	316	311	245	223	66	108	71	269	31	275	286	282	301	80	143
CHEYENNE, WYO.	108	112	26	76	76	91		81	81	103	140	187	83	79	189	319	143	90	113	101	119	241	95	119	76	62	104	128	81	92	83	219	84	98	268	262	303	87	100
CHICAGO, ILL.	161	175	302	82	78	125	272		93	144	221	266	268	80	242	293	210	151	155	245	208	262	157	156	350	308	173	190	91	116	97	254	101	212	274	272	295	106	131
CLEVELAND, OHIO	197	209	297	80	55	179	277	277		176	240	272	275	310	252	293	228	245	180	261	235	268	226	175	290	296	219	214	95	136	105	262	127	250	278	277	296	124	156
COLUMBIA, S. C.	268	267	317	41	10	354	299	329	356		270	295	311	350	271	308	256	326	189	300	279	282	320	174	331	323	297	246	39	53	37	279	7	305	295	290	307	33	85
DALLAS, TEXAS	81	82	349	57	49	61	325	36	50	80		319	15	45	266	325	157	47	97	15	61	280	55	112	32	11	65	115	60	71	61	277	55	40	308	291	315	63	80
DENVER, COLORADO	103	107	22	73	72	87	6	75	77	99	134		74	74	189	325	138	84	109	91	112	246	90	116	70	55	98	124	78	88	80	224	80	91	283	267	308	83	96
DES MOINES, IOWA	134	144	318	80	78	105	271	84	87	123	197	262		81	231	297	187	105	135	197	171	257	116	141	69	5	133	165	87	104	91	247	92	137	273	270	296	97	115
DETROIT, MICH.	188	200	295	86	79	164	273	263	129	168	233	268	268		248	291	222	224	174	254	227	265	208	171	282	292	206	207	100	133	109	258	128	238	275	274	294	124	151
EL PASO, TEXAS	77	78	14	58	54	64	8	50	56	76	79	8	42	53		345	98	57	86	48	71	285	62	97	46	33	68	92	61	69	62	290	59	57	335	298	327	64	75
HELENA, MONTANA	112	116	85	84	88	100	133	97	93	108	134	141	105	92	162		136	101	115	115	122	203	105	119	94	91	111	127	89	98	92	180	94	109	179	224	283	95	104
HOUSTON, TEXAS	64	60	348	50	40	49	329	25	39	67	338	325	6	34	285	327		34	84	3	26	288	40	103	22	5	46	86	52	60	53	289	45	24	314	297	319	53	68
INDIANAPOLIS, IND.	166	185	308	72	58	110	281	332	62	143	234	276	290	41	250	298	220		157	267	226	267	168	158	338	316	188	199	80	107	85	261	80	251	281	277	298	94	127
JACKSONVILLE, FLA.	327	309	324	33	9	1	308	339	0	8	286	304	323	355	282	314	273	340		314	300	288	338	163	341	332	326	271	29	34	28	287	8	323	303	295	312	23	39
KANSAS CITY, MO.	120	129	332	72	67	90	288	60	73	111	196	278	15	66	236	306	184	82	126		157	262	95	134	50	9	113	157	78	93	81	253	79	97	282	275	302	85	105
LITTLE ROCK, ARK.	97	104	335	59	48	65	307	26	48	92	243	300	352	41	260	315	208	43	114	338		276	55	128	21	356	71	158	62	76	64	271	56	22	297	286	309	67	89
LOS ANGELES, CALIF.	81	82	41	62	61	70	52	62	65	79	88	57	60	62	100	19	96	67	87	67	81		70	94	59	52	76	92	65	71	66	95	67	69	35	319	348	68	78
LOUISVILLE, KY.	166	190	313	66	47	87	287	339	43	137	242	282	301	26	256	302	227	348	156	280	239	271		158	342	322	202	205	71	98	75	266	63	278	285	281	301	82	120
MIAMI, FLORIDA	337	326	329	22	3	355	313	342	356	355	302	310	329	353	291	318	290	342	345	321	315	293	341		342	335	334	298	18	16	15	293	1	330	308	299	315	11	13
MILWAUKEE, WIS.	162	175	297	87	88	132	267	170	107	147	218	261	253	99	239	290	207	157	156	235	204	259	160	157		298	172	188	98	121	103	251	111	203	271	270	293	113	135
MINNEAPOLIS, MINN.	145	154	291	91	96	123	248	125	108	135	193	242	184	105	227	283	186	132	144	189	175	248	137	146	114		148	169	99	116	104	237	110	159	259	261	287	111	127
NASHVILLE, TENN.	140	180	320	59	40	61	295	354	36	114	251	290	318	24	261	307	231	8	142	298	254	275	22	150	353	333		205	63	83	65	271	50	313	291	285	305	68	103
NEW ORLEANS, LA.	50	37	337	46	32	38	318	9	28	60	299	313	347	22	283	321	270	17	86	339	339	288	22	114	7	351	23		46	56	47	287	35	359	308	296	315	47	64
NEW YORK, N. Y.	233	240	296	54	303	251	281	281	280	223	255	278	280	286	262	294	244	269	213	271	253	274	259	202	287	293	251	237		205	229	269	269	266	283	282	297	235	208
NORFOLK, VA.	249	253	306	35	342	291	290	303	319	236	264	286	295	318	268	301	253	294	217	285	267	279	284	198	308	307	269	244	25		16	274	322	284	289	286	302	343	208
PHILADELPHIA, PA.	233	240	298	52	317	255	283	285	289	221	255	279	283	294	263	296	246	273	212	273	255	275	263	199	292	296	252	235	49	197		270	279	269	284	282	298	235	203
PHOENIX, ARIZONA	80	83	29	61	59	69	35	58	62	79	89	40	55	59	108	0	100	64	89	62	80	277	70	97	55	45	74	93	64	72	66		64	66	1	300	334	68	79
PITTSBURGH, PA.	210	221	300	72	18	213	280	286	308	188	246	276	281	310	257	295	235	264	189	268	244	271	246	181	296	299	234	222	85	140	96	265		261	281	279	297	123	165
ST. LOUIS, MO.	134	150	320	70	60	90	287	30	63	119	224	280	319	53	248	303	207	68	137	280	204	267	94	143	20	342	130	179	75	95	79	260	74		284	278	301	84	110
SALT LAKE CITY, UTAH	99	101	50	73	74	86	83	79	78	95	118	98	80	76	152	359	123	84	103	91	104	220	88	109	75	67	95	114	78	86	80	181	80	90		254	315	83	92
SAN FRANCISCO, CALIF.	86	86	54	66	67	75	70	70	70	83	96	75	70	68	109	39	101	73	90	77	88	136	77	96	67	62	81	97	69	76	71	114	71	77	66		1	73	81
SEATTLE, WASHINGTON	103	105	87	81	84	94	111	92	89	100	118	116	97	88	136	96	120	95	105	103	109	165	97	109	90	88	102	114	85	92	87	147	89	100	128	181		90	97
WASHINGTON, D. C.	233	240	302	52	342	263	285	293	307	215	256	281	287	308	263	298	245	280	205	277	257	275	268	192	300	302	254	235	53	163	53	270	305	273	285	283			



# Z-CODE FOR POINT-TO-POINT SERVICE

**Asterisk indicates U. S. Military Usage**

NOTE: Numbers 1-5 following the "Z" signal mean:

1. Very slight
2. Slight
3. Moderate
4. Severe
5. Extreme

- A -

\*ZAA YOU ARE NOT OBSERVING CIRCUIT DISCIPLINE.  
 \*ZAB YOUR SPEED KEY IMPROPERLY ADJUSTED.  
 \*ZAC Advise (Call sign of) frequency you are reading.  
 \*ZAD Cease using speed key.  
 \*ZAE Signal (1) Not understood (2) Not held.  
 \*ZAF Unable to receive you, try via \_\_\_\_\_.  
 \*ZAH Reroute the circuit by patching.  
 \*ZAI Unable to relay. We file.  
 \*ZAJ Run (foxes, RY's, mk, etc.)  
 \*ZAL Have been unable to break you.  
 \*ZAM Alter your wave-length.  
 \*ZAN Closing down, due to \_\_\_\_\_.  
 \*ZAO WE CAN RECEIVE ABSOLUTELY NOTHING.  
 \*ZAP Transmit only msgs of above precedence  
 \*ZAZ CAN'T UNDERSTAND VOICE. USE TELEGRAPH.  
 \*ZBA ACKNOWLEDGE, PLEASE.  
 \*ZBB Work (simplex, duplex, mux, sb).  
 \*ZBC Last word received (sent) was \_\_\_\_\_.  
 \*ZBD Revert to Automatic Relay.  
 \*ZBE Rerun tapes run on \_\_\_\_\_ since \_\_\_\_\_.  
 \*ZBF Punching tape for transmission.  
 \*ZBG Send blind until advised.  
 \*ZBH Send on (kcs). Will confirm later.  
 \*ZBI You are causing interference.

- B -

\*ZBA Cause of delay is \_\_\_\_\_.  
 \*ZBD Following was sent (time).  
 \*ZBE Retransmit message \_\_\_\_\_ to \_\_\_\_\_.  
 \*ZBG You are sending upper case.  
 \*ZBH Make call before transmitting traffic.  
 \*ZBI Listen for telephony.  
 \*ZBL Do not use break-in.  
 \*ZBM Put \_\_\_\_\_ (speed opr.) this frequency.  
 \*ZBN Break and go ahead with New slip.  
 \*ZBO Your tape reversed.  
 \*ZBP I HAVE TRAFFIC.  
 \*ZBQ (1) Characters indistinct (2) Spacing bad.  
 \*ZBR When & on what frequency was message received.  
 \*ZBS Break circuit. Retuning.  
 \*ZBT Shall I send by (method).  
 \*ZBU Blurring Signals (1) Dots heavy (2) Dots light.  
 \*ZBT Count \_\_\_\_\_ as \_\_\_\_\_ groups.  
 \*ZBU Report when in communication with \_\_\_\_\_.  
 \*ZBV Answer on \_\_\_\_\_ mc.  
 \*ZBW I shift (or ask \_\_\_\_\_) to (kcs).  
 \*ZBY Pull Back your tape one Yard.

- C -

\*ZCA Circuit Affected. Make readable signals.  
 \*ZCB Circuit Broken. Signal unheard.  
 \*ZCC Collate Code.  
 \*ZCD Your Collation is Different.  
 \*ZCF CHECK YOUR CENTER FREQUENCY, PLEASE.  
 \*ZCI Circuit Interrupted. Running & available.  
 \*ZCK Check Keying.  
 \*ZCL TRANSMIT CALL LETTERS INTELLIGIBLY.  
 \*ZCO Your Collation Omitted.  
 \*ZCP Conditions Poor, increase to maximum.  
 \*ZCR Using concentrator. Make warning signals.  
 \*ZCS Cease Sending.  
 \*ZCT Send Code Twice.  
 \*ZCW Are you in direct Communication With \_\_\_\_\_?

- D -

\*ZDA Hr. formal message, priority \_\_\_\_\_.  
 \*ZDB Expedite reply to my \_\_\_\_\_.  
 \*ZDC Diagnosing Circuit faults, will advise.  
 \*ZDE Message undelivered. (1) Will keep trying  
 (2) Advise disposal (3) Cancelling (4) Btr. ads.  
 \*ZDE Message \_\_\_\_\_ undelivered.  
 \*ZDF Frequency is Drifting to degree indicated, 1-5.  
 \*ZDF Message \_\_\_\_\_ received by addressee (time).  
 \*ZDG Accuracy of following doubtful.  
 \*ZDH Your Dots are too Heavy (long).  
 \*ZDL Your Dots are too Light (short).  
 \*ZDM Your Dots Missing.  
 \*ZDM This is a multiple-address message.  
 \*ZDN Report disposal of message \_\_\_\_\_.  
 \*ZDQ Message \_\_\_\_\_ relayed to \_\_\_\_\_ at \_\_\_\_\_ by \_\_\_\_\_.  
 \*ZDS Msg just trans erroneous. Correct version is \_\_\_\_\_.  
 \*ZDT Following Transmitters running Dual.  
 \*ZDT Don't Transmit exercise messages until advised.  
 \*ZDV Your Dots Varying length, please remedy.  
 \*ZDV Private message received for \_\_\_\_\_. Advise.  
 \*ZDY No private messages until ordered.

- E -

\*ZEC Have you received message \_\_\_\_\_.  
 \*ZED Experiencing Drop-outs, 1-5.  
 \*ZEF We are Experiencing Fill-ins, 1-5.  
 \*ZEG We are Experiencing Garbles, 1-5.  
 \*ZEI Accuracy of heading doubtful.  
 \*ZEL No answer required.  
 \*ZEL This message is correction to \_\_\_\_\_.  
 \*ZEN This message is classified.  
 \*ZEP Parts marked ZEP coming later.  
 \*ZEU Exercise (drill message).

- F -

\*ZFA Failing Auto.  
 \*ZFB Message intercepted or copied blind.  
 \*ZFB SIGNALS ARE FADING BADLY.  
 \*ZFB Pass this message to \_\_\_\_\_.  
 \*ZFC Check your FSK shift, please.  
 \*ZFD Depth of Fading is as indicated, 1-5.  
 \*ZFD This message is a suspected duplicate.  
 \*ZFF Advise when message received by \_\_\_\_\_.  
 \*ZFH Message for (1) Action, (2) Info, (3) Comment.  
 \*ZFI Reply to message? There is no reply.  
 \*ZFK Revert to FSK.  
 \*ZFO SIGNALS FADED OUT.  
 \*ZFQ/x Frequency shift your signal is \_\_\_\_\_ cps.  
 \*ZFR Rapidity of Fading is as indicated, 1-5.  
 \*ZFR Cancel transmission \_\_\_\_\_.  
 \*ZFS Signals are Fading Slightly.

- G -

\*ZGB Send (Answer).  
 \*ZGF \_\_\_\_\_ signals Good For \_\_\_\_\_ wpm.  
 \*ZGF Make call signs more distinctly.  
 \*ZGP Please Give Priority.  
 \*ZGS YOUR SIGNALS GETTING STRONGER.  
 \*ZGW YOUR SIGNALS GETTING WEAKER.

- H -

\*ZHA How are conditions for Auto reception?  
 \*ZHC HOW ARE YOUR RECEIVING CONDITIONS?  
 \*ZHM/x Harmonic radiation from transmitter.  
 \*ZHS Send High Speed auto \_\_\_\_\_ wpm.  
 \*ZHY We are Holding Your \_\_\_\_\_.  
 \*ZIM Industrial or Medical interference, 1-5.  
 \*ZIP Increase Power.  
 \*ZIR You have strong Idle Radiation.  
 \*ZIS Atmospheric Interference, 1-5.

- J -

\*ZJF Frequency Jumping to degree indicated, 1-5.

- K -

\*ZKA Who is controlling station? or I am \_\_\_\_\_.  
 \*ZKB Permission necessary before transmitting msgs.  
 \*ZKD Take control of net \_\_\_\_\_ or shall I \_\_\_\_\_.  
 \*ZKE I (or \_\_\_\_\_) reports into circuit (net).  
 \*ZKF Station leaves net temporarily.  
 \*ZKJ Closing down (until \_\_\_\_\_).  
 \*ZKO REVERT TO ON/OFF KEYING.  
 \*ZKQ Say when ready to resume.  
 \*ZKS What Stations Keeping watch on \_\_\_\_\_?  
 \*ZKW Keying Weight is \_\_\_\_\_ (percent).

- L -

\*ZLB Give Long Breaks, please.  
 \*ZLD We are getting Long Dash from you.  
 \*ZLL Distorted LandLine control signals.  
 \*ZLP Low (minimum) Power.  
 \*ZLS WE ARE SUFFERING FROM LIGHTNING STORM.

- M -

\*ZMG Magnetic activity.  
 \*ZMO STAND BY MOMENT.  
 \*ZMP MisPunch or Performer failures.  
 \*ZMQ Stand by for \_\_\_\_\_.  
 \*ZMU/x Multipath making \_\_\_\_\_ mark bias.

- N -

\*ZNB No Breaks, we send twice.  
 \*ZNB Authentication is \_\_\_\_\_.  
 \*ZNC NO COMMUNICATIONS WITH \_\_\_\_\_.  
 \*ZNC All stations authenticate.  
 \*ZND You are misusing authenticator.  
 \*ZNG Receiving conditions No Good for code.  
 \*ZNI NO CALL LETTERS (IDENTIFICATION) HEARD.  
 \*ZNN ALL CLEAR OF TRAFFIC.  
 \*ZNO Not On the air.  
 \*ZNR Not Received.  
 \*ZNS Here New Slip.

- O -

\*ZOA Have checked (call-letters) \_\_\_\_\_ OK.  
 \*ZOC Relay to your sub-stations.  
 \*ZOD Observing \_\_\_\_\_ will transfer when better.  
 \*ZOD Act as radio link between me and \_\_\_\_\_.  
 \*ZOE Can you accept message? (or) Give me message.  
 \*ZOF Relay this message.  
 \*ZOG Transmit your message (give info.).  
 \*ZOH What traffic have you On Hand?  
 \*ZOK WE ARE RECEIVING OK.  
 \*ZOK Relay this message via \_\_\_\_\_.  
 \*ZOL OK. On Line.  
 \*ZOM Mail delivery permissible.  
 \*ZOR Transmit Only Reversals.  
 \*ZOU Give instructions for routing traffic.  
 \*ZOZ Obtain retransmission of message \_\_\_\_\_.  
 \*ZPA Printer line Advance not received.  
 \*ZPA Your speech distorted.  
 \*ZPC Printer Carriage-return not received.  
 \*ZPC Signals fading, 1-5.  
 \*ZPE Punch Everything.  
 \*ZPF Printer motor Fast.  
 \*ZPO Send Plain Once.  
 \*ZPP Punch Plain only.  
 \*ZPR Rerun slip at Present Running.  
 \*ZPS Printer motor Slow.  
 \*ZPT Send Plain Twice.

- P -

- R -

\*ZRA Reverse Auto tape.  
 \*ZRA Mr frequency OK? Your frequency is \_\_\_\_\_.  
 \*ZRB Relayed signal Bad, adjust receiver.  
 \*ZRB Check your frequency on this circuit.  
 \*ZRC Can you Receive Code?  
 \*ZRC Shall I, or tune your transmitter to \_\_\_\_\_.  
 \*ZRE Hear you best on (kcs).  
 \*ZRF Send tuning signals on present frequency.  
 \*ZRK Reversed Keying.  
 \*ZRL Rerun slip before one now running.  
 \*ZRM Please Remove Modulation from \_\_\_\_\_.  
 \*ZRM I receive (usb, lsb, isb's)  
 \*ZRN ROUGH NOTE.  
 \*ZRO ARE YOU RECEIVING OK?  
 \*ZRR Run Reversals.  
 \*ZRS Rerun message No. \_\_\_\_\_.  
 \*ZRT Revert to Traffic.  
 \*ZRY Run test slip, please.

- S -

\*ZSF SEND FASTER.  
 \*ZSH STATIC HEAVY HERE.  
 \*ZSI/x Please furnish Signal Intensity.  
 \*ZSM/x Microvolt input to receiver is \_\_\_\_\_.  
 \*ZSN Give SINPO report on \_\_\_\_\_ S Signal strength.  
 I Interference.  
 N Noise.  
 P Propagation.  
 O Overall readability.

- T -

\*ZSO Transmit Slips Once.  
 \*ZSR YOUR SIGNALS STRONG & READABLE.  
 \*ZSS Send Slower.  
 \*ZST Transmit Slips Twice.  
 \*ZSU YOUR SIGNALS ARE UNREADABLE.  
 \*ZSV Your Speed Varying.

- U -

\*ZTA Transmit by Auto.  
 \*ZTH Transmit by Hand.  
 \*ZTI Transmission temporarily Interrupted.  
 \*ZUA Conditions Unsuitable for Automatic recording.  
 \*ZUA Timing signal will be transmitted.  
 \*ZUB WE HAVE BEEN UNABLE TO BREAK YOU.  
 \*ZUC UNABLE TO COMPLY. WILL DO SO AT \_\_\_\_\_.  
 \*ZUE Affirmative (Yes).  
 \*ZUG Negative (No).  
 \*ZUH Unable to comply.  
 \*ZUJ Wait. Stand by.

- V -

\*ZVB Varying Bias.  
 \*ZVF Signals Varying in Frequency.  
 \*ZVP Send V's Please.  
 \*ZVR Pass at once to sub-stations.  
 \*ZVS Signals Varying in intensity.

- W -

\*ZWB Name of operator on watch.  
 \*ZWC Wipers or Clicks here.  
 \*ZWO SEND WORDS ONCE.  
 \*ZWR YOUR SIGNALS WEAK BUT READABLE.  
 \*ZWS Wavelength (frequency) is Swinging, 1-5.  
 \*ZWT SEND WORDS TWICE.

- Y -

\*ZYS WHAT IS YOUR SPEED OF TRANSMISSION?  
 \*ZZF Incorrect.  
 \*ZZG You are correct.  
 \*ZZH TRY AGAIN.

- Z -

## MULTIPLEX

\*ZYA Cease traffic; send A's on A channel.  
 \*ZYC Cycling on ARQ, errors stored your end.  
 \*ZYK Check Your Keying on channel \_\_\_\_\_.  
 \*ZYM Change from single printer to Multiplex.  
 \*ZYN Make bias Neutral.  
 \*ZYP Change from multiplex to single Printer.  
 \*ZYR Please put \_\_\_\_\_ on MUX revolutions.  
 \*ZYT Check Your Thyratrons.  
 \*ZYX/x Revert to MUX frames \_\_\_\_\_ channels.

## RADIOPHOTO AND FACSIMILE

\*ZXA Adjust to receive speeds \_\_\_\_\_.  
 \*ZXC Pix \_\_\_\_\_ Conditionally accepted.  
 \*ZXD Send Dashes, please.  
 \*ZXF You are Floating Fast.  
 \*ZXH Limits High, reduce \_\_\_\_\_ cycles.  
 \*ZXJ You are Jumping out of phase.  
 \*Z XK Is your synchronizing correct?  
 \*ZXL Limits are Low, increase \_\_\_\_\_ cycles.  
 \*ZXO Last run defaced due to \_\_\_\_\_.  
 \*ZXP Go ahead with Pix.  
 \*ZXS You are floating Slow.  
 \*ZXV Your modulation is Varying.

Sources: Cable and Wireless Ltd.  
 U. S. Army Communications Manual SIG 439-2  
 ACP-131 (A), Allied-Comms. Procedures  
 W3AFM



# THE GEOGRAPHICAL CENTER OF THE UNITED STATES

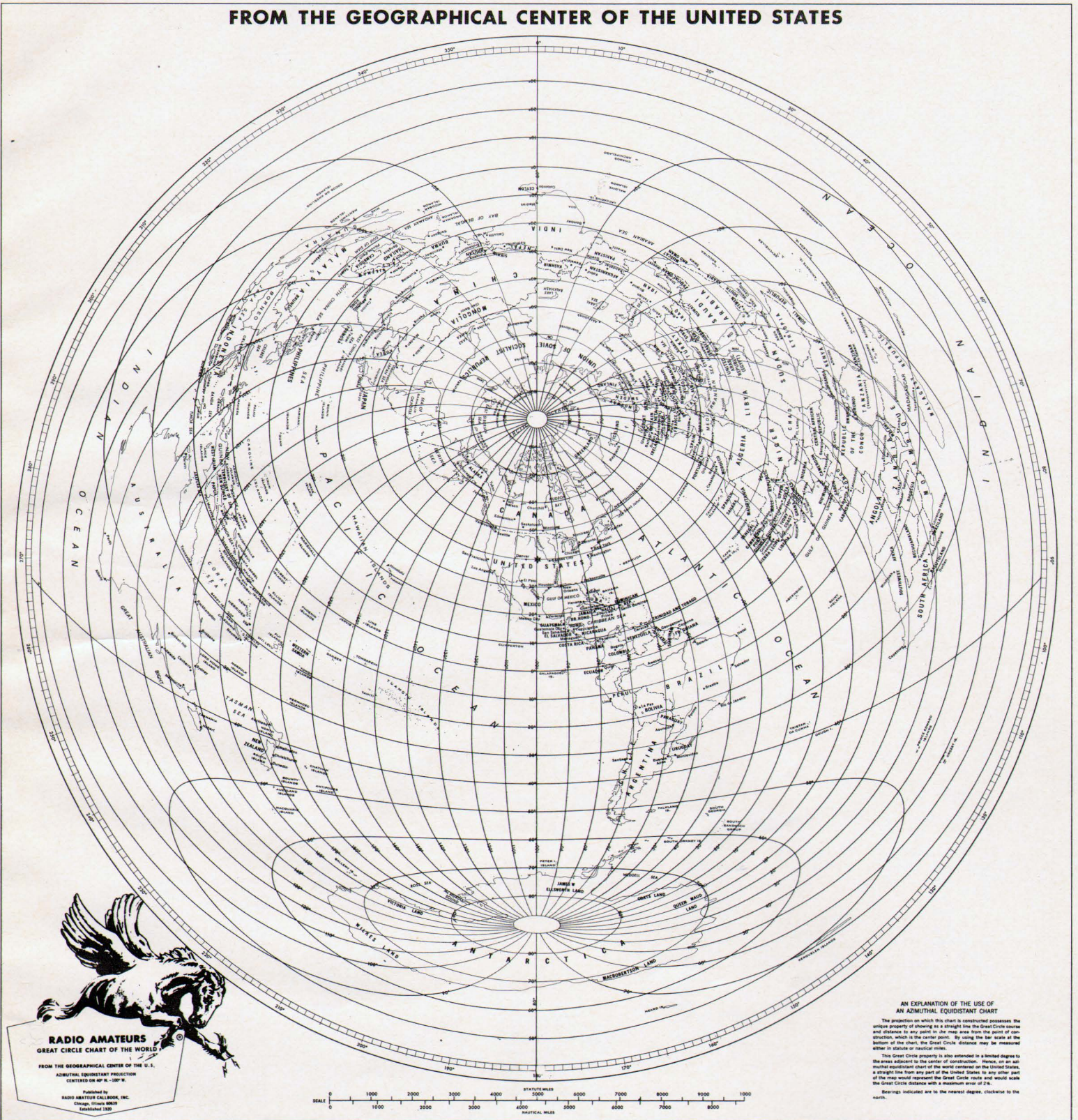
The table below shows the great circle bearing in degrees from the point indicated above to countries throughout the world having licensed radio amateurs. Where cities are shown the bearing to the nearest degree is given. These bearings were compiled from information supplied by the U. S. Coast and Geodetic Survey.

PREFIX	COUNTRY	BEARING	PREFIX	COUNTRY	BEARING	PREFIX	COUNTRY	BEARING
AC3	SIKKIM	353	KS6	U S SAMOA	248	VQ8	CHAGOS IS.	17
AC4	TIBET, LHASA	351	KV4	VIRGIN IS.	117		MAURITIUS & RODRIGUEZ IS.	53
AC5	BHUTAN	351	KW6	WAKE IS.	288	VQ9	SEYCHELLES IS.	40
AP	PAKISTAN, KARACHI	14	KX6	MARSHALL IS.	280	VR1	GILBERT, ELLICE & OCEAN IS.	270
BV	TAIWAN, TAIPEI	323	KZ5	CANAL ZONE	145	VR2	FIJI IS.	252
BY	CHINA, CHUNGKING	337	LA	NORWAY, OSLO	32	VR3	FANNING & LINE IS.	253
	PEKING	334		SVALBARD IS.	13	VR4	SOLOMON IS.	270
	SHANGHAI	326		JAN MAYEN IS.	24	VR5	TONGA IS.	245
CE	CHILE, SANTIAGO	156	LU	ARGENTINA, BUENOS AIRES	148	VR6	PITCAIRN IS.	210
CE0A	EASTER IS.	190	LX	LUXEMBOURG	42	VS5	BRUNEI	317
CE0Z	JUAN FERNANDEZ IS.	163	LZ	BULGARIA, SOFIA	39	VS6	HONG KONG	328
CM,CO	CUBA, HAVANA	136	MP4	MUSCAT & OMAN, MASQAT	23	VS9	ADEN, ADEN	41
CN	MOROCCO, CASABLANCA	62	OA	PERU, LIMA	154	VU	INDIA, BOMBAY	9
CP	BOLIVIA, LA PAZ	147	OD5	LEBANON, BEIRUT	37		CALCUTTA	353
CR3	PORTUGUESE GUINEA	85	OE	AUSTRIA, VIENNA	39		NEW DELHI	4
CR4	CAPE VERDE IS.	87	OH	FINLAND, HELSINKI	26	VU4	LACCADIVE IS.	10
CR6	ANGOLA, NOVA LISBOA	84	OH0	ALAND IS.	28	VU5	ANDAMAN & NICOBAR IS.	346
CR7	MOZAMBIQUE, LOURENCO MARQUES	86	OK	CZECHOSLOVAKIA, PRAGUE	38	XE	MEXICO, MEXICO CITY	182
	MOZAMBIQUE	67	ON	BELGIUM, BRUSSELS	42	XE4	REVILLAGIGEDO IS.	211
CR8	GOA	9	OX	GREENLAND, GODTHAAB	32	XW8	LAOS	338
CR8	TIMOR IS.	296	OY	FAERCE IS.	35	XZ	BURMA, RANGOON	343
CR9	MACAO	328	OZ	DENMARK, COPENHAGEN	34	YA	AFGHANISTAN, KANDAHAR	14
CT1	PORTUGAL, LISBON	59	PA,PI	NETHERLANDS, AMSTERDAM	40	YI	IRAQ, BAGHDAD	31
CT2	AZORES IS.	67	PJ	NETHERLANDS ANTILLES	128	YJ	NEW HEBRIDES, VILLA	261
CT3	MADEIRA IS.	68	PJ2M	SINT MAARTEN	115	YK	SYRIA	34
CX	URUGUAY, MONTEVIDEO	146	PX1	ANDORRA	50	YN	NICARAGUA, MANAGUA	155
DJ,DL	WEST GERMAN FEDERAL REP, BONN	41	PY	BRAZIL, BRASÍLIA	129	YO	RUMANIA, BUCHAREST	36
DM	E. GERMAN DEMOCRATIC REP, BERLIN	37		RIO DE JANEIRO	130	YS	EL SALVADOR, SAN SALVADOR	160
DU	PHILIPPINES, MANILA	317		NATAL	112	YT,YU	YUGOSLAVIA, BELGRADE	39
EA	SPAIN, MADRID	55	PY0	TRINDADE & MARTIN VAZ IS.	118	YV	VENEZUELA, CARACAS	127
EA6	BALEARIC IS.	53	PZ	SURINAM	119	ZA	ALBANIA, TIRANA	42
EA8	CANARY IS.	70	SL,SM	SWEDEN, STOCKHOLM	29	ZB2	GIBRALTAR	59
EA9	SPANISH SAHARA	70	SP	POLAND, WARSAW	34	ZD3	GAMBIA	85
EA0	RIO MUNI	75	ST	SUDAN, KHARTOUM	50	ZD5	SWAZILAND	88
EI	IRELAND, DUBLIN	43	SU	EGYPT, CAIRO	42	ZD7	SAINT HELENA	101
EL	LIBERIA, MONROVIA	87	SV	GREECE, ATHENS	42	ZD8	ASCENSION IS.	100
EP,EQ	IRAN, TEHRAN	24	SV5	DODECANESE IS.	41	ZD9	TRISTAN DA CUNHA & GOUGH IS.	122
ET3	ETHIOPIA, ADDIS ABABA	49	TA,TC	TURKEY, ANKARA	35	ZE	SOUTHERN RHODESIA, SALISBURY	78
	ASMARA	45	TF	ICELAND, REYKJAVIK	34	ZK1	COOK IS.	235
F	FRANCE, PARIS	44	TG	GUATEMALA, GUATEMALA CITY	162	ZK2	NIUE IS.	244
FB8	AMSTERDAM AND ST. PAUL IS.	58	TI	COSTA RICA	153	ZL1	NEW ZEALAND, AUCKLAND	238
	KERGUELEN IS.	143	TJ	CAMEROUN, YAOUNDE	74	ZL2	WELLINGTON	235
FC	CORSICA	47	TL8	CENTRAL AFRICAN REP, BANGUI	68	ZL3	CHRISTCHURCH	233
FG7	GUADELOUPE	116	TN8	REPUBLIC OF CONGO, BRAZZAVILLE	78	ZL4	DUNEDIN	232
FH8	COMORO IS.	61	TR8	GABON, LIBREVILLE	78	ZP	PARAGUAY, ASUNCION	142
FK8	NEW CALEDONIA, NOUMEA	255	TT8	CHAD, FT. LAMY	65	ZS	SOUTH AFRICA, CAPE TOWN	104
FL8	FRENCH SOMALILAND, DJIBOUTI	43	TU2	IVORY COAST, ABIDJAN	83		DURBAN	92
FM7	MARTINIQUE	117	TZ	MALI REPUBLIC, BAMAKO	80		JOHANNESBURG	90
FO8	FRENCH POLYNESIA, TAHITI	230	UA1	SOVIET UNION, MOSCOW	23	ZS2	PRINCE EDWARD & MARION IS.	117
	CLIPPERTON IS.	201	UA9,0	ASIATIC RUSSIAN S.F.S.R.	346	ZS3	SOUTH-WEST AFRICA, WINDHOEK	93
FP8	ST. PIERRE & MIQUELON IS.	63	UB5	UKRAINIAN S.S.R.	30	ZS8	BASUTOLAND	94
FR7	REUNION IS.	58	UC2	WHITE RUSSIAN S.S.R.	30	ZS9	BECHUANALAND, MAFEKING	91
FS7	SAINT MARTIN IS.	115	UD6	AZERBAIDZHAN S.S.R.	26	3A2	MONACO	47
FU8	NEW HEBRIDES, VILA	258	UF6	GEORGIAN S.S.R.	26	3V8	TUNISIA, TUNIS	50
FW8	WALLIS & FUTUNA IS.	252	UG6	ARMENIAN S.S.R.	27	3W8	VIETNAM, SAIGON	329
FY7	FRENCH GUIANA, CAYENNE	118	UH8	TURKMEN S.S.R.	18	4S7	CEYLON, COLOMBO	2
G	ENGLAND, LONDON	43	UI8	UZBEK S.S.R.	11	4W1	YEMEN	40
GC	CHANNEL IS.	46	UJ8	TADZHIK S.S.R.	10	4X4	ISRAEL	38
GD	ISLE OF MAN	42	UL7	KAZAKH S.S.R.	13	5A	LIBYA, TRIPOLI	52
GI	NORTHERN IRELAND, BELFAST	42	UM8	KIRGHIZ S.S.R.	5	5B4,ZC4	CYPRUS	38
GM	SCOTLAND, GLASGOW	40	UN1	KARELO-FINNISH S.S.R.	19	5H3	TANZANIA, DAR ES SALAAM	60
GW	WALES	44	UO5	MOLDAVIAN S.S.R.	33	5N2	NIGERIA, LAGOS	77
HA,HG	HUNGARY, BUDAPEST	38	UP	LITHUANIAN S.S.R.	30	5R8	MALAGASY REPUBLIC, TANANARIVE	64
HB	SWITZERLAND, BERN	44	UQ	LATVIAN S.S.R.	29	5T5	MAURITANIA, NOUAKCHOTT	80
HB0	LIECHTENSTEIN	43	UR	ESTONIAN S.S.R.	27	5U7	NIGER, NIAMEY	73
HC	ECUADOR, QUITO	150	VE1	CANADA, HALIFAX	68	5V	TOGO	79
HC8	GALAPAGOS IS.	166	VE2	MONTREAL	65	5W1	WESTERN SAMOA	249
HH	HAITI, PORT-AU-PRINCE	126	VE3	TORONTO	69	5X5	UGANDA	60
HI	DOMINICAN REP, SANTO DOMINGO	122	VE4	WINNIPEG	5	5Z4	KENYA, NAIROBI	58
HK	COLOMBIA, BOGOTA	141	VE5	SASKATOON	338	60	SOMALI REPUBLIC, MOGADISHU	47
HK0	SAN ANDRES & PROVIDENCIA IS.	146	VE6	EDMONTON	329	6W8	SENEGAL, DAKAR	84
HM,HL9	KOREA, SEOUL	325	VE7	VANCOUVER	307	6Y5	JAMAICA	133
HP	PANAMA	146	VE8	FORT NELSON	329	7G1	REPUBLIC OF GUINEA, CONAKRY	86
HR	HONDURAS, TEGUCIGALPA	156	VK1	AUSTRALIA, CANBERRA	252	7Q7	MALAWI, ZOMBA	72
HS	THAILAND, BANGKOK	338	VK2	SYDNEY	253	7X	ALGERIA, ALGIERS	54
HV	VATICAN CITY	45	VK3	MELBOURNE	251	7Z,HZ	SAUDI ARABIA, MECCA	40
I	ITALY, ROME	45	VK4	BRISBANE	258	8F1,2,3	JAVA, BATAVIA	319
	TRIESTE	42	VK5	ADELAIDE	257	8F4	SUMATRA	326
IS	SARDINIA	49	VK6	PERTH	275	8F5	BORNEO	312
IT	SICILY	48	VK7	TASMANIA, HOBART	244	8F6	CELEBES & MOLUCCA IS.	307
JA	JAPAN, TOKYO	316	VK8	DARWIN	288	9A1,M1	SAN MARINO	44
JT1	MONGOLIA, ULAN BATOR	343	VK9	NORFOLK IS.	249	9G1	GHANA, ACCRA	80
JY	JORDAN	38		NEW GUINEA, PAPUA, PORT MORESBY	278	9H1	MALTA	49
JZ0	WEST IRIAN	289	VK0	HEARD IS.	161	9J	ZAMBIA, LUSAKA	78
KB6	BAKER IS.	262		MACQUARIE IS.	226	9K2	KUWAIT	30
KC4	NAVASSA IS.	130	VO1	NEWFOUNDLAND, ST JOHNS	61	9L1	SIERRA LEONE, FREETOWN	86
KC6	CAROLINE IS.	294	VO2	LABRADOR, HOPEDALE	45	9M2	FEDERATION OF MALAYSIA	333
KG4	GUANTANAMO BAY, CUBA	128	VP1	BRITISH HONDURAS	155	9M4	SINGAPORE	328
KG6	MARIANAS IS, GUAM	298	VP2	ANTIGUA	115	9M6	SABAH, NORTH BORNEO	315
KG6I	KOLCAND IS.	308	VP3	BRITISH GUIANA, GEORGETOWN	121	9M8	SARAWAK	320
KG6S	SAIPAN IS.	298	VP5	TURKS & CAICOS IS.	120	9N1	NEPAL, KATMANDU	356
KH6	HAWAII, HONOLULU	268	VP6	BARBADOS	117	9Q5	REP. OF THE CONGO, LEOPOLDVILLE	78
KL7	ALASKA, ANCHORAGE	322	VP7	BAHAMA IS.	123		ELISABETHVILLE	75
	FAIRBANKS	328	VP8	FALKLAND IS.	156		STANLEYVILLE	66
KM6	MIDWAY IS.	286		SOUTH GEORGIA IS.	147	9U5	BURUNDI	65
KP4	PUERTO RICO	119		SOUTH ORKNEY IS.	155	9X5	RWANDA	65
KR6,8	RYUKYU IS, OKINAWA	319	VP9	BERMUDA IS.	95	9Y4,VP4	TRINIDAD & TOBAGO IS.	121
KS4	SWAN IS.	146	VO1	ZANZIBAR	60			



# RADIO AMATEURS GREAT CIRCLE CHART OF THE WORLD

## FROM THE GEOGRAPHICAL CENTER OF THE UNITED STATES





# SAN FRANCISCO, CALIF.

The table below shows the great circle bearing in degrees from the point indicated above to countries throughout the world having licensed radio amateurs. Where cities are shown the bearing to the nearest degree is given. These bearings were compiled from information supplied by the U. S. Coast and Geodetic Survey.

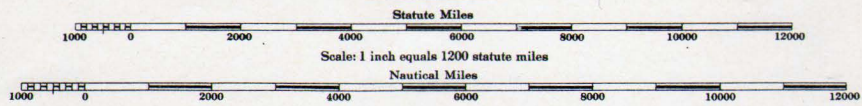
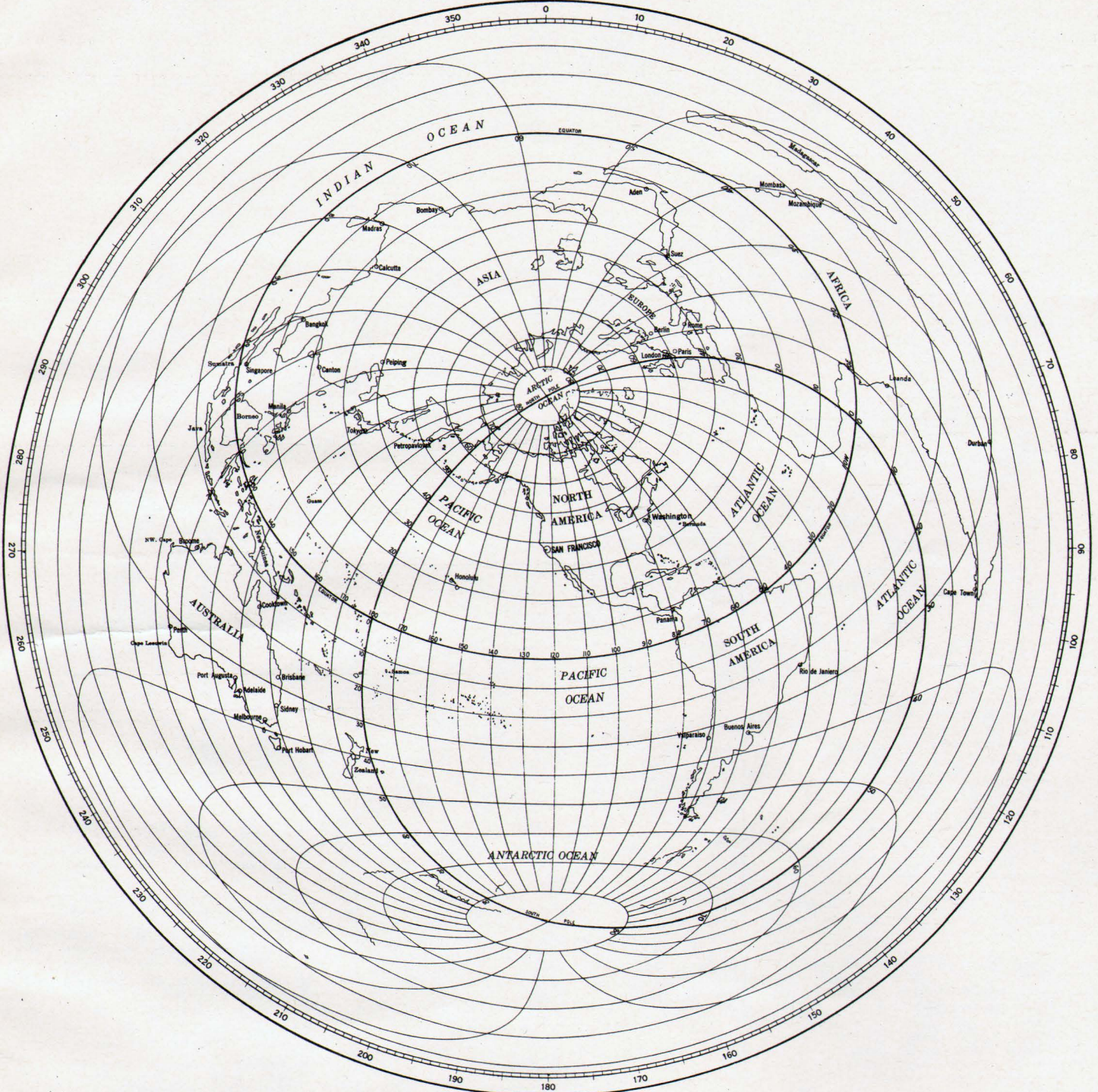
PREFIX	COUNTRY	BEARING	PREFIX	COUNTRY	BEARING	PREFIX	COUNTRY	BEARING
AC3	SIKKIM	331	KS6	U S SAMOA	230	VQ8	CHAGOS IS.	337
AC4	TIBET, LHASA	331	KV4	VIRGIN IS.	94		MAURITIUS & RODRIGUEZ IS.	9
AC5	BHUTAN	329	KW6	WAKE IS.	275	VQ9	SEYCHELLES IS.	5
AP	PAKISTAN, KARACHI	351	KX6	MARSHALL IS.	263	VR1	GILBERT, ELLICE & OCEAN IS.	255
BV	TAIWAN, TAIPEI	305	KZ5	CANAL ZONE	116	VR2	FIJI IS.	237
BY	CHINA, CHUNGKING	319	LA	NORWAY, OSLO	22	VR3	FANNING & LINE IS.	235
	PEKING	320		SVALBARD IS.	9	VR4	SOLOMON IS.	257
	SHANGHAI	310		JAN MAYEN IS.	20	VR5	TONGA IS.	231
CE	CHILE, SANTIAGO	139	LU	ARGENTINA, BUENOS AIRES	132	VR6	PITCAIRN IS.	187
CE0A	EASTER IS.	167	LX	LUXEMBOURG	32	VS5	BRUNEI	296
CE0Z	JUAN FERNANDEZ IS.	145	LZ	BULGARIA, SOFIA	25	VS6	HONG KONG	310
CM,CO	CUBA, HAVANA	101	MP4	MUSCAT & OMAN, MASQAT	8	VS9	ADEN, ADEN	15
CN	MOROCCO, CASABLANCA	49	OA	PERU, LIMA	130	VU	INDIA, BOMBAY	343
CP	BOLIVIA, LA PAZ	126	OD5	LEBANON, BEIRUT	20		CALCUTTA	329
CR3	PORTUGUESE GUINEA	71	OE	AUSTRIA, VIENNA	28		NEW DELHI	342
CR4	CAPE VERDE IS.	73	OH	FINLAND, HELSINKI	16	VU4	LACCADIVE IS.	342
CR6	ANGOLA, NOVA LISBOA	68	OH0	ALAND IS.	18	VU5	ANDAMAN & NICOBAR IS.	320
CR7	MOZAMBIQUE, LOURENCO MARQUES	69	OK	CZECHOSLOVAKIA, PRAGUE	26	XE	MEXICO, MEXICO CITY	126
	MOZAMBIQUE	40	ON	BELGIUM, BRUSSELS	31	XE4	REVILLAGIGEDO IS.	149
CR8	GOA	342	OX	GREENLAND, GODTHAAB	34	XW8	LAOS	316
CR8	TIMOR IS.	275	OY	FAEROE IS.	28	XZ	BURMA, RANGOON	319
CR9	MACAO	308	OZ	DENMARK, COPENHAGEN	24	YA	AFGHANISTAN, KANDAHAR	12
CT1	PORTUGAL, LISBON	47	PA,PI	NETHERLANDS, AMSTERDAM	30	YI	IRAQ, BAGHDAD	3
CT2	AZORES IS.	56	PJ	NETHERLANDS ANTILLES	103	YJ	NEW HEBRIDES, VILLA	243
CT3	MADEIRA IS.	56	PJ2M	SINT MAARTEN	94	YK	SYRIA	17
CX	URUGUAY, MONTEVIDEO	131	PX1	ANDORRA	39	YN	NICARAGUA, MANAGUA	119
DJ,DL	WEST GERMAN FEDERAL REP, BONN	030	PY	BRAZIL, BRASILIA	112	YO	RUMANIA, BUCHAREST	23
DM	E. GERMAN DEMOCRATIC REP, BERLIN	026		RIO DE JANEIRO	115	YS	EL SALVADOR, SAN SALVADOR	121
DU	PHILIPPINES, MANILA	298		NATAL	97	YT,YU	YUGOSLAVIA, BELGRADE	26
EA	SPAIN, MADRID	42	PY0	TRINDADE & MARTIN VAZ IS.	104	YV	VENEZUELA, CARACAS	104
EA6	BALEARIC IS.	40	PZ	SURINAM	100	ZA	ALBANIA, TIRANA	29
EA8	CANARY IS.	58	SL,SM	SWEDEN, STOCKHOLM	19	ZB2	GIBRALTAR	46
EA9	SPANISH SAHARA	47	SP	POLAND, WARSAW	22	ZD3	GAMBIA	71
EA0	RIO MUNI	58	ST	SUDAN, KHARTOUM	30	ZD5	SWAZILAND	72
EI	IRELAND, DUBLIN	34	SU	EGYPT, CAIRO	24	ZD7	SAINT HELENA	89
EL	LIBERIA, MONROVIA	72	SV	GREECE, ATHENS	27	ZD8	ASCENSION IS.	87
EP,EQ	IRAN, TEHRAN	6	SV5	DODECANESE IS.	25	ZD9	TRISTAN DA CUNHA & GOUGH IS.	114
ET3	ETHIOPIA, ADDIS ABABA	25	TA,TC	TURKEY, ANKARA	20	ZE	SOUTHERN RHODESIA, SALISBURY	58
	ASMARA	22	TF	ICELAND, REYKJAVIK	30	ZK1	COOK IS.	223
F	FRANCE, PARIS	33	TG	GUATEMALA, GUATEMALA CITY	121	ZK2	NIUE IS.	228
FB8	AMSTERDAM AND ST. PAUL IS.	264	TI	COSTA RICA	119	ZL1	NEW ZEALAND, AUCKLAND	226
	KERGUELEN IS.	212	TJ	CAMEROUN, YAOUNDE	55	ZL2	WELLINGTON	224
FC	CORSICA	34	TL8	CENTRAL AFRICAN REP, BANGUI	50	ZL3	CHRISTCHURCH	223
FG7	GUADELOUPE	95	TN8	REPUBLIC OF CONGO, BRAZZAVILLE	50	ZL4	DUNEDIN	222
FH8	COMORO IS.	30	TR8	GABON, LIBREVILLE	61	ZP	PARAGUAY, ASUNCION	125
FK8	NEW CALEDONIA, NOUMEA	240	TT8	CHAD, FT. LAMY	47	ZS	SOUTH AFRICA, CAPE TOWN	95
FL8	FRENCH SOMALILAND, DJIBOUTI	19	TU2	IVORY COAST, ABIDJAN	67		DURBAN	79
FM7	MARTINIQUE	96	TZ	MALI REPUBLIC, BAMAKO	65		JOHANNESBURG	74
F08	FRENCH POLYNESIA, TAHITI	209	UA1	SOVIET UNION, MOSCOW	22	ZS2	PRINCE EDWARD & MARION IS.	128
	CLIPPERTON IS.	153	UA9,Z	ASIATIC RUSSIAN S.F.S.R.	335	ZS3	SOUTH-WEST AFRICA, WINDHOEK	79
FP8	ST. PIERRE & MIQUELON IS.	57	UB5	UKRAINIAN S.S.R.	16	ZS8	BASUTOLAND	81
FR7	REUNION IS.	9	UC2	WHITE RUSSIAN S.S.R.	18	ZS9	BECHUANALAND, MAFEKING	71
FS7	SAINT MARTIN IS.	94	UD6	AZERBAIDZHAN S.S.R.	8	3A2	MONACO	35
FU8	NEW HEBRIDES, VILA	243	UF6	GEORGIAN S.S.R.	13	3V8	TUNISIA, TUNIS	37
FW8	WALLIS & FUTUNA IS.	236	UG6	ARMENIAN S.S.R.	10	3W8	VIETNAM, SAIGON	305
FY7	FRENCH GUIANA, CAYENNE	99	UH8	TURKMEN S.S.R.	3	4S7	CEYLON, COLOMBO	330
G	ENGLAND, LONDON	33	UI8	UZBEK S.S.R.	354	4W1	YEMEN	16
GC	CHANNEL IS.	36	UJ8	TADZHIK S.S.R.	350	4X4	ISRAEL	21
GD	ISLE OF MAN	33	UL7	KAZAKH S.S.R.	350	5A	LIBYA, TRIPOLI	37
GI	NORTHERN IRELAND, BELFAST	34	UM8	KIRGHIZ S.S.R.	351	5B4,ZC4	CYPRUS	21
GM	SCOTLAND, GLASGOW	31	UN1	KARELO-FINNISH S.S.R.	12	5H3	TANZANIA, DAR ES SALAAM	35
GW	WALES	34	UO5	MOLDAVIAN S.S.R.	21	5N2	NIGERIA, LAGOS	62
HA,HG	HUNGARY, BUDAPEST	26	UP	LITHUANIAN S.S.R.	19	5R8	MALAGASY REPUBLIC, TANANARIVE	29
HB	SWITZERLAND, BERN	32	UQ	LATVIAN S.S.R.	18	5T5	MAURITANIA, NOUAKCHOTT	66
HB0	LIECHTENSTEIN	31	UR	ESTONIAN S.S.R.	17	5U7	NIGER, NIAMEY	57
HC	ECUADOR, QUITO	123	VE1	CANADA, HALIFAX	62	5V	TOGO	62
HC8	GALAPAGOS IS.	137	VE2	MONTREAL	62	5W1	WESTERN SAMOA	237
HH	HAITI, PORT-AU-PRINCE	100	VE3	TORONTO	66	5X5	UGANDA	38
HI	DOMINICAN REP, SANTO DOMINGO	98	VE4	WINNIPEG	48	5Z4	KENYA, NAIROBI	34
HK	COLOMBIA, BOGOTA	115	VE5	SASKATOON	33	60	SOMALI REPUBLIC, MOGADISHU	19
HK0	SAN ANDRES & PROVIDENCIA IS.	113	VE6	EDMONTON	18	6W8	SENEGAL, DAKAR	70
HM,HL9	KOREA, SEOUL	311	VE7	VANCOUVER	359	6Y5	JAMAICA	105
HP	PANAMA	116	VE8	FORT NELSON	360	7G1	REPUBLIC OF GUINEA, CONAKRY	71
HR	HONDURAS, TEGUCIGALPA	118	VK1	AUSTRALIA, CANBERRA	240	7Q7	MALAWI, ZOMBA	50
HS	THAILAND, BANGKOK	312	VK2	SYDNEY	240	7X	ALGERIA, ALGIERS	41
HV	VATICAN CITY	32	VK3	MELBOURNE	239	7Z,HZ	SAUDI ARABIA, MECCA	19
I	ITALY, ROME	32	VK4	BRISBANE	244	8F1,2,3	JAVA, BATAVIA	291
	TRIESTE	29	VK5	ADELAIDE		8F4	SUMATRA	300
IS	SARDINIA	35	VK6	PERTH	259	8F5	BORNEO	290
IT	SICILY	33	VK7	TASMANIA, HOBART	234	8F6	CELEBES & MOLUCCA IS.	285
JA	JAPAN, TOKYO	303	VK8	DARWIN	268	9A1,M1	SAN MARINO	31
JT1	MONGOLIA, ULAN BATOR	329	VK9	NORFOLK IS.	235	9G1	GHANA, ACCRA	66
JY	JORDAN	19	VK0	NEW GUINEA, PAPUA, PORT MORESBY	266	9H1	MALTA	35
JZ0	WEST IRIAN	273		HEARD IS.	209	9J	ZAMBIA, LUSAKA	58
KB6	BAKER IS.	246		MACQUARIE IS.	218	9K2	KUWAIT	9
KC4	NAVASSA IS.	102	VO1	NEWFOUNDLAND, ST JOHNS	55	9L1	SIERRA LEONE, FREETOWN	72
KC6	CAROLINE IS.	275	VO2	LABRADOR, HOPEDALE	46	9M2	FEDERATION OF MALAYSIA	306
KG4	GUANTANAMO BAY, CUBA	100	VP1	BRITISH HONDURAS	116	9M4	SINGAPORE	301
KG6	MARIANAS IS., GUAM	287	VP2	ANTIGUA	94	9M6	SABAH, NORTH BORNEO	294
KG6I	VOLCANO IS.	293	VP3	BRITISH GUIANA, GEORGETOWN	102	9M8	SARAWAK	294
KG6S	SAIPAN IS.	282	VP5	TURKS & CAICOS IS.	95	9N1	NEPAL, KATMANDU	334
KH6	HAWAII, HONOLULU	252	VP6	BARBADOS	97	9Q5	REP. OF THE CONGO, LEOPOLDVILLE	61
KL7	ALASKA, ANCHORAGE	333	VP7	BAHAMA IS.	97		ELISABETHVILLE	55
	FAIRBANKS	340	VP8	FALKLAND IS.	145		STANLEYVILLE	47
KM6	MIDWAY IS.	275		SOUTH GEORGIA IS.	140	9U5	BURUNDI	43
KP4	PUERTO RICO	96		SOUTH ORKNEY IS.	149	9X5	RWANDA	43
KR6,8	RYUKYU IS., OKINAWA	302	VP9	BERMUDA IS.	79	9Y4,VP4	TRINIDAD & TOBAGO IS.	100
KS4	SWAN IS.	108	VQ1	ZANZIBAR	34			



# CHART OF THE WORLD

Showing Great Circle Distances and Azimuths  
from San Francisco, Cal. to all Points on the Earth's Surface

*Vessels should not use this chart for navigational purposes*





## SPECIAL ARRL QN SIGNALS FOR NET USE

QNA*	Answer in prearranged order.
QNB*	Act as relay Between . . . . . and . . . . .
QNC	All net stations Copy. I have a message for all net stations.
QND*	Net is Directed (controlled by net control station).
QNE*	Entire net please stand by.
QNF	Net is Free (not controlled).
QNG	Take over as net control station.
QNH	Your net frequency is High.
QNI	Net stations report In.* I am reporting into the net.
QNJ	Can you copy me? Can you copy . . . . . ?
QNK*	Transmit messages for . . . . . to . . . . .
QNL	Your net frequency is Low.
QNM*	You are QRMing the net. Please stand by.
QNN	Net control station is . . . . . * What station has net control?
QNO	Station is leaving the net.
QNP	Unable to copy you (or . . . . .).
QNQ*	Move frequency to . . . and wait for . . . to finish handling traffic. Then send him traffic for . . . . .
QNR*	Answer . . . and Relay (or Receive) traffic.
QNS	Following Stations are in the net.* (Follow with list). Request list of stations in the net.
QNT	Leaving net Temporarily (or for . . . minutes).
QNU*	The net has traffic for YOU. Stand by.
QNV*	Establish contact with . . . . . on this frequency. If successful, move to . . . and send him traffic for . . .
QNW	How do I route messages for . . . . . ?
QNX	You are excused from the net.* Request to be excused from the net.
QNY*	Shift to another frequency (or to . . . kc.) to clear traffic with . . . . .
QNZ	Zero beat your signal with mine.

\*For use only by Net Control Station

## Notes on the Use of QN Signals

1. The QN signals listed above are special ARRL signals for use in amateur c.w. nets only. Other meanings that may be used in other services do not apply.
2. Some QN signals are for use by net control stations only; these are marked with an asterisk (\*). Others have slightly different meanings when used by the NCS and net stations; in this case, the meaning when used by the NCS is marked with an asterisk (\*).
3. Some QN signals have two meanings, the difference depending on how or by whom used. Examples: (a) QNC, when used as a preface to transmission of a message, carries its first meaning; when used by a station reporting into the net (e.g., W9NCS DE W9NET QNI QNC), it carries its second meaning. (b) QNI, when used by the NCS, is a request for stations to report in; when used by a net station, it means that this station is reporting in. (c) QNJ, when used alone, carries its first meaning; when followed by a call, it carries the second meaning.
4. QN signals are never followed by a question mark, even though the meaning may be interrogatory.
5. Do not use QN signals on phone nets. Say it with words.
6. Use QN signals in nets only. They are not for use in casual amateur conversation.
7. Make frequent use of standard international "Q" signals in traffic nets, for meanings not covered by QN signals. Examples: QRU, QRV, QSV, QTA, QTB, QTX, etc.

ARRL Communications Department

## "Q" SIGNALS

Given below are a number of Q signals whose meanings most often need to be expressed with brevity and clearness in amateur work. (Q abbreviations take the form of questions only when each is sent followed by a question mark.)

QAV	Are you calling me? I am calling . . . . .
QBT	Am I missing dots? You are missing dots.
QCM	Is there a defect in my transmission? There seems to be a defect in your transmission.
QDH	What is causing the present interference? The present interference is being caused by . . . . .
QIF	What frequency is . . . . . (station) using? . . . . . (station) is using . . . . . (frequency).
QRG	Will you tell me my exact frequency in kilocycles? Your frequency is . . . . . kc.
QRH	Does my frequency vary? Your frequency varies.
QRI	How is the tone of my transmission? The tone of your transmission is . . . . . (1, good; 2, variable; 3, bad).
QRJ	Are you receiving me badly? Are my signals weak? I cannot receive you. Your signals are too weak.
QRK	What is the readability of my signals (1 to 5)? The readability of your signals is . . . . . (1 to 5).
QRL	Are you busy? I am busy or busy with (. . . . .).
QRM	Are you being interfered with? I am interfered with.
QRN	Are you troubled by atmospherics? I am being troubled by atmospherics.
QRO	Must I increase power? Increase power.
QRP	Must I decrease power? Decrease power.
QRR	Shall I send faster? Send faster (. . . words per min.).
QRS	Shall I send more slowly? Send more slowly (. . . w.p.m.).
QRT	Shall I stop sending? Stop sending.
QRU	Have you anything for me? I have nothing for you.
QRV	Are you ready? I am ready.
QRW	Shall I tell . . . . . that you are calling him? Please tell . . . . . that I am calling him.
QRX	When will you call again? I will call you again at . . . . . hours (on . . . kc.).
QRZ	Who is calling me? You are being called by . . . . .
QSA	What is the strength of my signals (1 to 5)? The strength of your signals is . . . . . (1 to 5).
QSB	Does the strength of my signals vary? The strength of your signals varies.
QSD	Is my keying correct? Are my signals distinct? Your keying is incorrect; your signals are bad.
QSG	Shall I send . . . telegrams (or one) at a time? Send . . . telegrams at a time.
QSK	Can you hear me between your signals? I can hear you between my signals.
QSL	Can you give me acknowledgment of receipt? I give you acknowledgment of receipt.
QSM	Shall I repeat the last telegram I sent you? Repeat the last telegram you sent me.
QSO	Can you communicate with . . . direct (or through . . .)? I can communicate with . . . direct (or through . . .).
QSP	Will you relay to . . . . . ? I will relay to . . . . .
QSV	Shall I send a series of VVV . . . . . ? Send a series of VVV.
QSW	Will you send on . . . kcs. ? etc. I will send on . . . kcs., etc.
QSX	Will you listen for . . . . . (call sign) on . . . kcs? I am listening for . . . . . on . . . kcs.
QSY	Shall I change . . . kcs. without changing the type of wave? Change to . . . kc. without changing type of wave.
QSZ	Shall I send each word or group twice? Send each word or group twice.
QTA	Shall I cancel nr . . . as if it had not been sent? Cancel nr . . . as if it had not been sent.
QTB	Do you agree with my number of words? I do not agree with your number of words; I will repeat the first letter of each word and the first figure of each number.
QTC	How many telegrams have you to send? I have . . . telegrams for you or for . . . . .
QTH	What is your position (location)? My location is . . . . . (by any indication).
QTR	What is the exact time? The time is . . . . .
QTX	Will you keep your station open for further communication? I will keep my station open for further communication.

CQ General call to any station.

Special abbreviations adopted by ARRL:

QST	General call preceding a message addressed to all amateurs and ARRL Members. This is in effect "CQ ARRL".
QRRR	Official ARRL "Iand SOS". A distress call for emergency use only by station in an emergency situation. Indicate your call, location, situation and other data, even if no QSO results.

ARRL Communications Department

## ARRL Phonetic Alphabet

A	ADAM
B	BAKER
C	CHARLIE
D	DAVID
E	EDWARD
F	FRANK
G	GEORGE
H	HENRY
I	IDA
J	JOHN
K	KING
L	LEWIS
M	MARY
N	NANCY
O	OTTO
P	PETER
Q	QUEEN
R	ROBERT
S	SUSAN
T	THOMAS
U	UNION
V	VICTOR
W	WILLIAM
X	X-RAY
Y	YOUNG
Z	ZEBRA

## ON GOOD PHONE OPERATING

1. Listen much . . . with care. Avoid distractions in your operating room. Tune the band well after each call.
2. Time your calls; monitor your own frequency. Call only when a station is free.
3. Make short calls, with breaks to listen. Speak clearly, at a steady, modest rate. Three short calls are better than one long one.
4. Use push-to-talk technique . . . speak near the mike. Watch the modulation indicator. Keep local background noise at a minimum.
5. Make notes. Avoid missing points for comment. Jot down topics to avoid repeats.
6. Talk in connected thoughts and phrases. Notes will help avoid mixing up subjects. Push-to-talk technique will keep brother amateurs from calling you a monologist.
7. Speak naturally. QSOs need not be cut and dried. Make them interesting. Avoid exhibitionism. Use proper operating form to promote efficiency in communication and add respect and prestige for your station.

Use of this standard list is recommended by ARRL. Haphazard selection of words often results in confusion. A degree of uniformity in use of phonetic words reflects favorably on your individual operating, and on the whole amateur service.

ARRL Communications Department.



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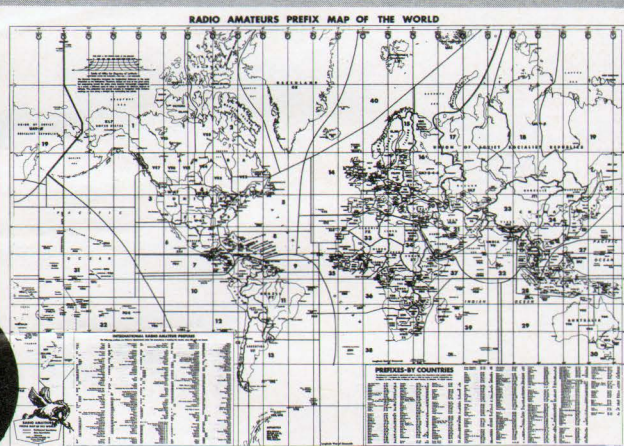
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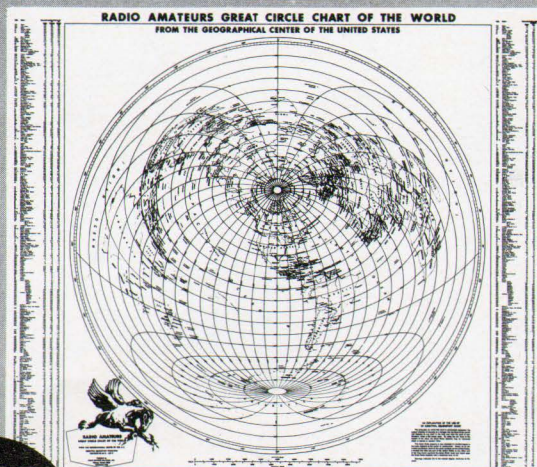
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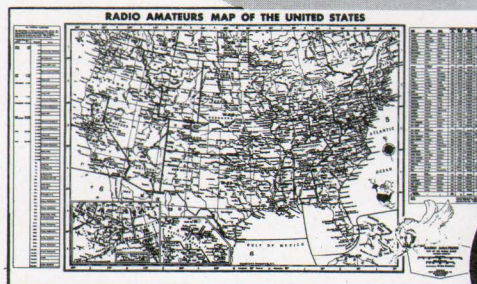
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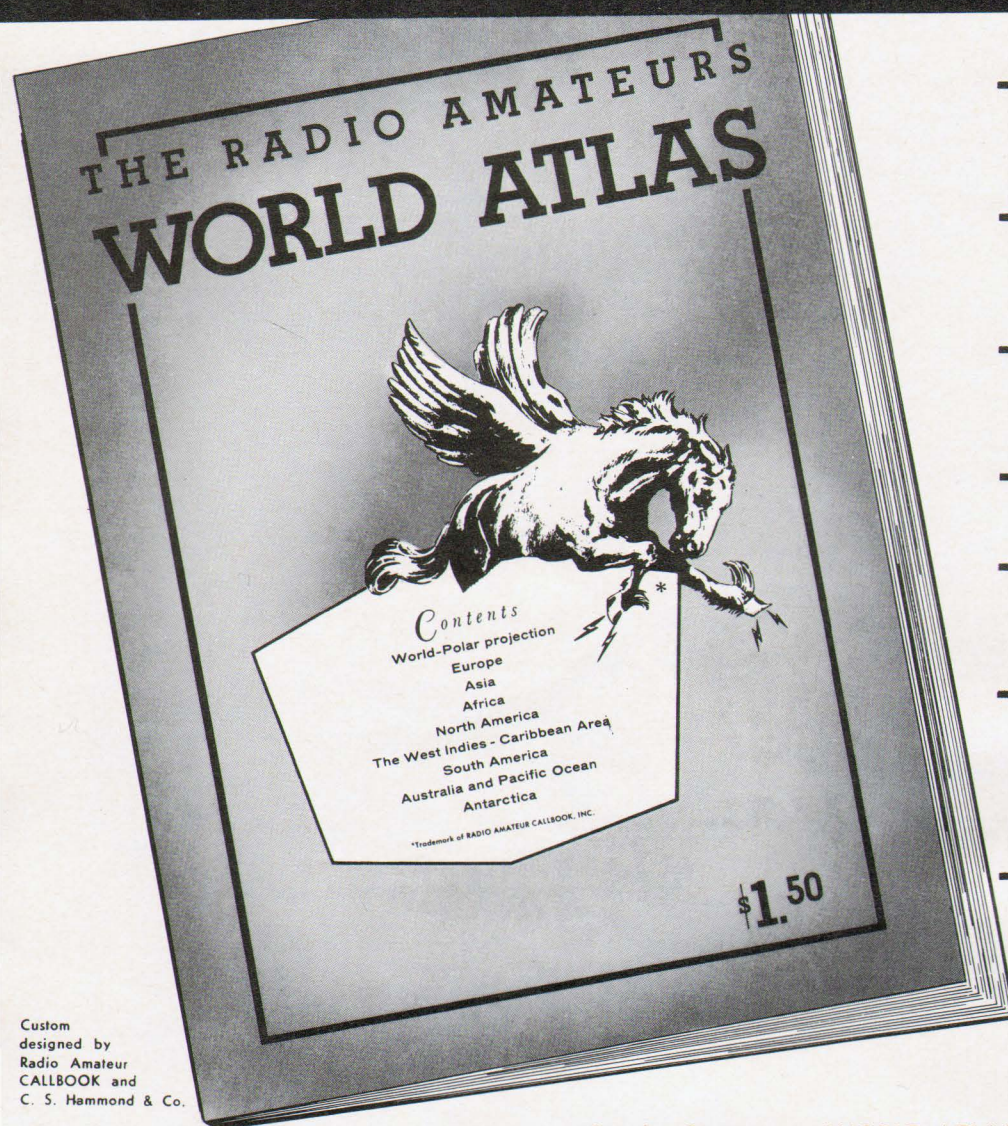
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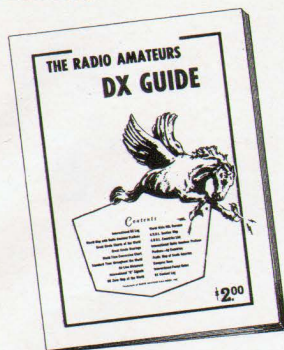
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BIRMINGHAM, ALA.	140		1174	1052	776	442	1119	578	618	334	581	1095	670	641	1152	1602	567	433	374	579	325	1802	331	665	659	862	182	312	864	638	783	1456	608	400	1466	2013	2082	661	512
BISMARCK, N. D.	1244	1174		1489	1106	1133	440	734	1014	1359	990	531	506	926	1081	534	1211	881	1529	618	943	1267	965	1838	682	384	1030	1297	1396	1430	1367	1095	1127	779	694	1265	1013	1318	1474
BOSTON, MASS.	937	1052	1489		400	622	1735	851	551	791	1551	1769	1159	613	2072	2024	1605	807	1017	1251	1259	2596	826	1255	857	1123	943	1359	188	471	271	2300	483	1038	2099	2699	2493	393	673
BUFFALO, NEW YORK	697	776	1106	400		344	1335	454	173	623	1198	1370	760	216	1692	1640	1286	435	879	861	913	2198	483	1181	458	731	627	1086	292	947	279	1906	178	662	1699	2300	2117	292	598
CHARLESTON, W. VA.	353	442	1133	622	344		1246	400	217	302	935	1256	673	284	1475	1642	984	262	553	701	642	2054	225	870	461	755	322	754	440	311	365	1733	168	465	1616	2205	2132	253	350
CHEYENNE, WYOMING.	1229	1119	440	1735	1335	1246		891	1199	1390	726	96	583	1125	653	521	947	986	1493	560	813	882	1033	1763	878	642	1032	1131	1604	1556	1556	663	1298	795	371	967	973	1477	1540
CHICAGO, ILLINOIS	587	578	734	851	454	400	891		308	652	803	920	309	238	1252	1248	940	165	863	414	552	1745	269	1188	81	355	397	833	713	699	666	1453	410	262	1260	1858	1737	597	745
CLEVELAND, OHIO	554	618	1014	551	173	217	1199	308		518	1025	1227	617	90	1525	1541	1114	263	770	700	740	2049	311	1087	335	630	459	924	405	432	360	1749	115	492	1568	2166	2026	306	541
COLUMBIA, S. C.	194	334	1359	791	623	302	1390	652	518		914	1380	863	585	1484	1837	891	489	256	830	644	2123	395	569	726	998	358	599	605	332	523	1781	448	603	1751	2317	2326	405	178
DALLAS, TEXAS	721	581	990	1551	1198	935	726	803	1025	914		663	632	999	572	1247	225	763	908	451	293	1240	726	1111	857	862	617	443	1374	1196	1299	887	1070	547	999	1483	1681	1185	1091
DENVER, COLORADO	1212	1095	531	1769	1370	1256	96	920	1227	1380	663		610	1156	557	591	879	1000	1467	558	780	831	1038	1726	914	700	1023	1082	1631	1566	1579	586	1320	796	371	949	1021	1494	1537
DES MOINES, IOWA	739	670	506	1159	760	673	583	309	617	863	632	610		546	983	977	821	411	1023	180	478	1438	476	1333	309	235	525	827	1022	983	973	1155	715	273	953	1550	1467	896	993
DETROIT, MICHIGAN	596	641	926	613	216	284	1125	238	90	585	999	1156	546		1479	1455	1105	240	831	645	723	1983	316	1152	252	543	470	939	482	522	443	1690	205	455	1492	2091	1938	396	623
EL PASO, TEXAS	1291	1152	1081	2072	1692	1475	653	1252	1525	1484	572	557	983	1479		1065	676	1264	1473	839	847	701	1254	1643	1279	1157	1169	983	1905	1755	1836	346	1590	1034	689	995	1376	1728	1661
HELENA, MONTANA	1697	1602	534	2024	1640	1642	521	1248	1541	1837	1247	591	977	1455	1065		1467	1382	1973	1023	1315	924	1453	2260	1206	912	1488	1646	1929	1947	1897	907	1652	1236	403	807	490	1842	1969
HOUSTON, TEXAS	701	567	1211	1605	1286	984	947	940	1114	891	225	879	821	1105	676	1467		865	821	644	388	1374	803	968	1005	1056	665	318	1420	1204	1341	1017	1137	679	1200	1645	1891	1220	1066
INDIANAPOLIS, IND.	426	433	881	807	435	262	986	165	263	489	763	1000	411	240	1264	1382	865		699	453	483	1809	107	1024	243	511	251	712	646	573	585	1499	330	231	1356	1949	1872	494	593
JACKSONVILLE, FLA.	285	374	1529	1017	879	553	1493	863	770	256	908	1467	1023	831	1473	1973	821	699		950	690	2147	594	326	942	1191	499	504	838	546	758	1794	703	751	1837	2374	2455	647	346
KANSAS CITY, MISSOURI	676	579	618	1251	861	701	560	414	700	830	451	558	180	645	839	1023	644	453	950		325	1356	480	1241	443	413	473	680	1097	1009	1038	1049	781	238	925	1506	1506	945	981
LITTLE ROCK, ARK.	456	325	943	1259	913	642	813	552	740	644	293	780	478	723	847	1315	388	483	690	325		1480	435	949	618	708	325	355	1081	909	1007	1137	779	291	1148	1688	1785	892	818
LOS ANGELES, CALIF.	1936	1802	1267	2596	2198	2054	882	1745	2049	2123	1240	831	1438	1983	701	924	1374	1809	2147	1356	1480		1829	2339	1744	1524	1780	1673	2451	2355	2394	357	2136	1589	579	347	959	2300	2294
LOUISVILLE, KY.	319	331	965	826	483	225	1033	269	311	395	726	1038	476	316	1254	1453	803	107	594	480	435	1829		919	349	605	154	623	652	529	582	1508	344	242	1402	1886	1943	476	516
MIAMI, FLORIDA	604	665	1838	1255	1181	870	1763	1188	1087	569	1111	1726	1333	1152	1643	2260	968	1024	326	1241	949	2339	919		1267	1511	815	669	1092	797	1019	1982	1010	1061	2089	2594	2734	923	598
MILWAUKEE, WIS.	668	659	682	857	458	461	878	81	335	726	857	914	309	252	1279	1206	1005	243	942	443	618	1744	349	1267		299	478	910	733	749	694	1464	446	327	1242	1842	1692	637	810
MINNEAPOLIS, MINN.	907	862	384	1123	731	755	642	355	630	998	862	700	235	543	1157	912	1056	511	1191	413	708	1524	605	1511	299		697	1051	1018	1047	985	1280	743	466	987	1584	1395	934	1100
NASHVILLE, TENN.	214	182	1030	943	627	322	1032	397	459	358	617	1023	525	470	1169	1488	665	251	499	473	325	1780	154	815	478	697		469	761	586	685	1446	472	254	1393	1963	1975	569	517
NEW ORLEANS, LA.	424	312	1297	1359	1086	754	1131	833	924	599	443	1082	827	939	983	1646	318	712	504	680	355	1673	623	669	910	1051	469		1171	926	1089	1316	919	598	1434	1926	2101	966	769
NEW YORK, N. Y.	748	864	1396	188	292	440	1604	713	405	605	1374	1631	1022	482	1905	1929	1420	646	838	1097	1081	2451	652	1092	733	1018	761	1171		296	83	2145	317	875	1972	2571	2408	205	499
NORFOLK, VA.	505	638	1430	471	438	311	1556	699	432	332	1196	1566	983	522	1755	1947	1204	573	546	1009	909	2355	529	797	749	1047	586	926	296		222	2028	318	771	1927	2515	2436	146	203
PHILADELPHIA, PA.	666	783	1367	271	279	365	1556	666	360	523	1299	1579	973	443	1836	1897	1341	585	758	1038	1007	2394	582	1019	694	985	685	1089	83	222		2083	259	811	1925	2523	2380	123	423
PHOENIX, ARIZONA	1592	1456	1095	2300	1906	1733	663	1453	1749	1781	887	586	1155	1690	346	907	1017	1499	1794	1049	1137	357	1508	1982	1464	1280	1446	1316	2145	2028	2083		1828	1272	504	653	1114	1983	1954
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ST. LOUIS, MO.	467	400	779	1038	662	465	795	262	492	603	547	796	273	455	1034	1236	679	231	751	238	291	1589	242	1061	327	466	254	598	875	771	811	1272	559		1162	1744	1724	712	746
SALT LAKE CITY, UTAH	1583	1466	694	2099	1699	1616	371	1260	1568	1751	999	371	953	1492	689	403	1200	1356	1837	925	1148	579	1402	2089	1242	987	1393	1434	1972	1927	192								



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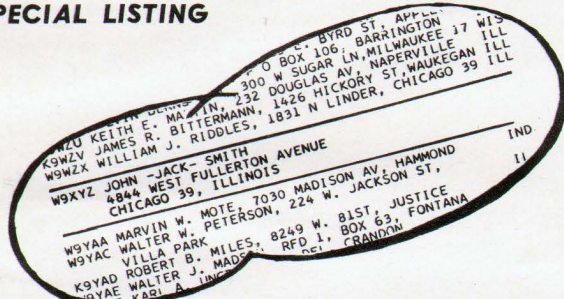
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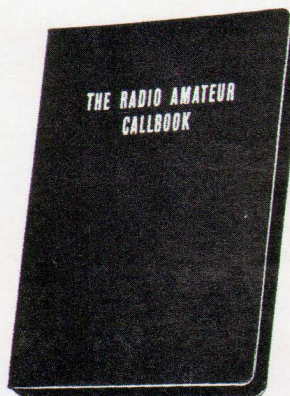
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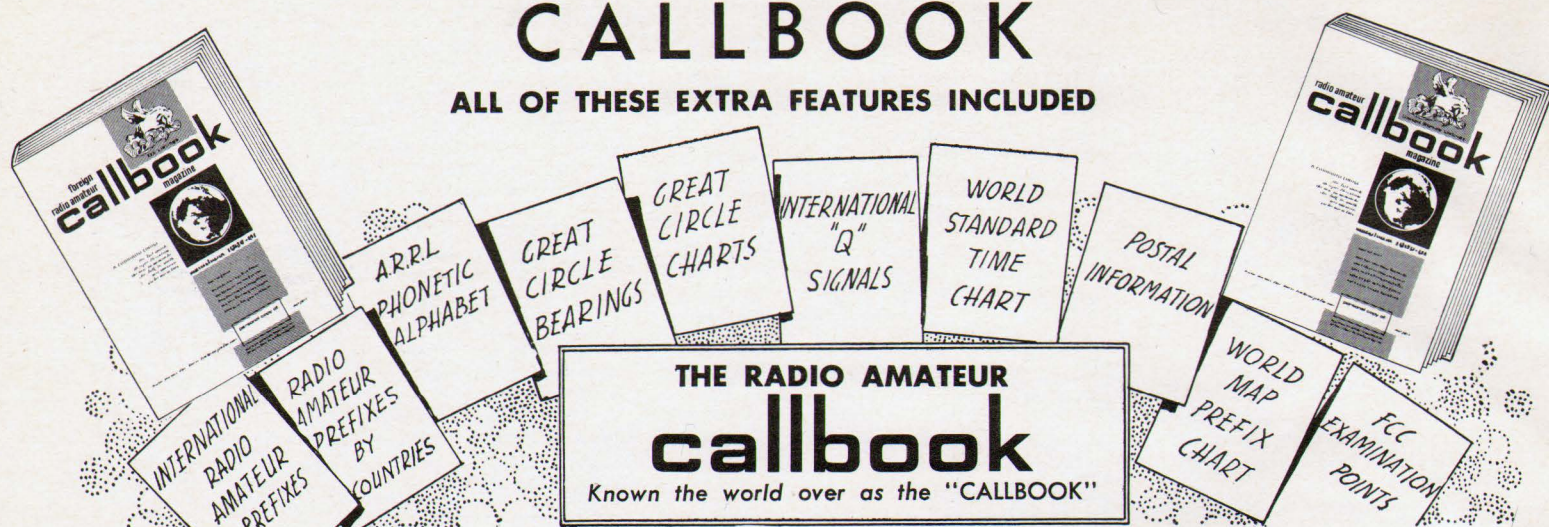
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